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A description of the four double-track bascule bridges and the interesting track and signal work installed under heavy traffic at a cost of \$4,000,000 as the last stage in this road's revision of its North Station facilities.

How the Baltimore & Ohio Handles Scrap 396

E. W. Walther, general storekeeper of the B. & O., which sells scrap valued at \$2,500,000 yearly, tells how this scrap is reclaimed at its source, how it is sorted for 50 cents a ton and how simplified practices and accounting avoid waste.

Railway Regulation Adrift 408

Misguided zeal has extended I. C. C. activities far beyond the few simple matters in which the public has an interest, according to Alexander H. Elder, general solicitor, Central of New Jersey, addressing the annual conference of the Wharton School, University of Pennsylvania, Philadelphia, Pa.

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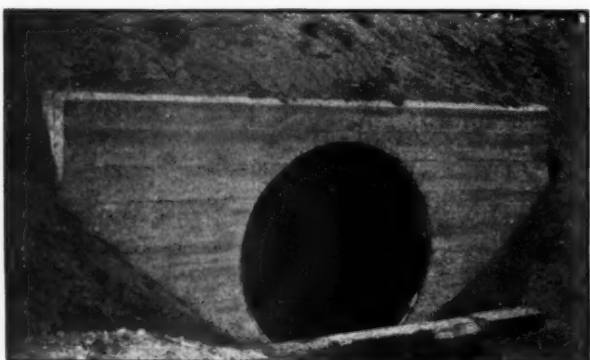
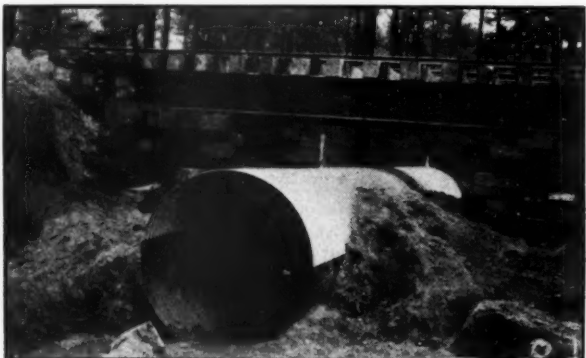
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Engineering Index Service

SAFE, ECONOMICAL



This 36-inch Armco Paved Invert Pipe was placed under trestle, then backfilled to track level.

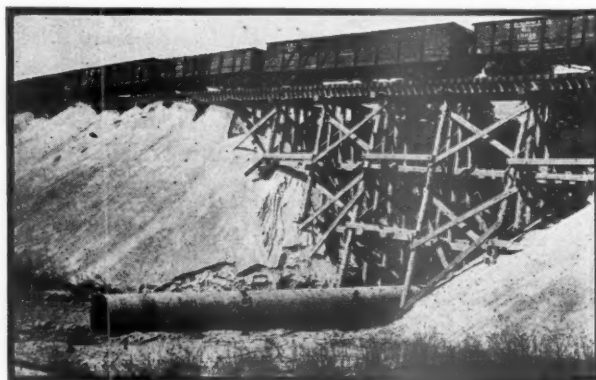


Upper photo: 66-inch Armco Paved Invert Pipe being installed under trestle. Lower: finished job. In excellent condition today.

SPEEDY and economical replacement of trestles and small span bridges is accomplished with Armco Paved Invert Pipe. Hundreds of installations under leading railroads attest this fact.

Ease and speed of installation. No interruption to traffic. Practically no expense for inspection and maintenance. These are advantages of Armco Paved Invert Pipe. Armco culverts, railroad veterans for 26 years, now have greater durability than ever before because of an extra-life pavement in the invert. Strength to spare—adequate waterway.

Jobs illustrated on these pages are typical of the safety and economy effected by the use of Armco Paved Invert Pipe and Armco Methods of trestle replacement.



66-inch Armco Paved Invert Pipe replacing a 250 foot trestle in Georgia.

ARMCO CULVERT

RAILWAY AGE

Regulation of Railway Earnings

The *Railway Age* often has been referred to in the press as the "organ" of the railways and industries dependent upon them for a market. This paper has tried to promote directly the welfare of the railway industry and the railway supply manufacturing industry, and indirectly the welfare of the public, by advocating what it has considered sound and constructive policies of railway regulation, but we now find ourselves in disagreement with spokesmen of both the Association of Railway Executives and the Railway Business Association regarding the most important proposed railway legislation pending in Congress—that to substitute a "flexible" rule of rate-making for Section 15-A of the Transportation act, which was discussed at length in the editorial entitled "The Proposed Rule of Rate-Making" published in our issue of February 13.

We agree with the spokesmen of these organizations that the objectives of any new legislation should be relief of the railways from such obligation as may exist to pay over to the government earnings that have become subject to recapture, and assurance of more adequate earnings in future. Our difference with them is as to the kind of legislation that should be sought to attain these objectives. It should be remarked in passing that most railway counsel who have handled important rate cases before the Interstate Commerce Commission and in the courts, and many railway executives and large owners of railway securities, agree with the *Railway Age* in regarding with apprehension the prospective repeal of the rate-making provisions of the Transportation act.

Concerning Recapture of Earnings

First, as to recapture. The recapture provisions appear in Section 15-A, together with the rate-making provisions, and were predicated by their advocates and authors upon the assumption that, in accordance with the rate-making provisions, the railways as a whole would be allowed to earn on the average a fair return, and that earnings would be recaptured from any railway that earned over six per cent on its valuation in any year only because and after the railways as a whole, or in any group, had been allowed to earn

a fair return. As the railways as a whole have failed by billions of dollars since 1920 to earn the fair return assured them, it would be most unfair and harmful for the government to continue to try to collect earnings claimed to have become subject to recapture. Even this, however, would not be an unmixed evil. Recapture must be based upon a constitutional valuation of each railway, and persistence by the government in trying to effect recapture would result in decisions by the Supreme court establishing higher valuations for individual railways, and therefore a larger aggregate valuation for all of the railways, than the commission is disposed to make. This is, perhaps, the principal reason why the commission and others who share its views regarding regulation are willing to have the recapture provisions repealed. It is also a reason why there need be no fear of recapture of any such amount as \$361,000,000 of past earnings. This estimate of past recapturable earnings is based upon the method of valuation favored by the commission in the O'Fallon case, which the Supreme court rejected, and is therefore greatly exaggerated. Whatever may be the correct amount, would not repeal of the rate-making provisions be a very high price to pay for relief from recapture?

Some History of Regulation

In order that all that is involved may be understood, it is necessary to recall some of the history of regulation. The passage of the Mann-Elkins act in 1910, over the opposition of the railways, increased the power of the commission from that of merely regulating rates to prevent unfair discriminations to that of suspending all proposed advances in rates, and thereby actually empowered it to regulate earnings. The passage of the LaFollette valuation act (Section 19-A of the Act to Regulate Commerce) in 1913, also over the opposition of the railways, established so-called "physical valuation" as the basis for regulation of earnings. Many who had opposed the Mann-Elkins act and the LaFollette valuation act, including the *Railway Age*, advocated the rate-making provisions of the Transportation act because they believed that, as Congress already had, by the two former acts,

empowered the commission to regulate, not merely rates, but earnings, it should by the latter act lay down for all time a definite rule for the commission in accordance with which railway earnings must be regulated. The proposed "flexible" rule, as advocated by the Association of Railway Executives and the Railway Business Association would, in effect, abolish valuation, and also a fair return upon it, as the standard for the commission to use in regulating earnings, but leave it all the power given by the Mann-Elkins and other laws to regulate both rates and earnings. In other words, it would leave the commission virtually unrestricted discretionary authority to determine how much net operating income the railways needed and should be allowed to earn.

Shall We Turn to the "Left"?

We do not wish to do injustice to those who favor this "flexible" rule but we believe their attitude is wrong and is dictated by ill-founded considerations. The nation is confronted at present more directly than ever before by the vitally important question as to whether it shall turn to the "left" or "right"—whether it shall take the road to socialism by increasing governmental power over and interference with business, with the attendant increases in governmental expenditures and taxation, or the road away from socialism by reducing bureaucratic power over and interference with business, and governmental expenditures and taxation. Although the railroad industry is virtually bankrupt, and its condition is largely due to the failure of the commission to carry out a law passed by Congress, we are told that Congress is in such a mood that there can be no hope of legislation more favorable to the railways than repeal of the recapture provisions, conditional upon repeal of the rate-making provisions; and that as "we have the commission" and will continue to have it the railways must get along with it as best they can—as badly as experience indicates that that may be.

This, in our opinion, concedes that the railroad industry must turn to the "left" to save itself—that it must yield, almost without a struggle, in order to avoid recapture of a comparatively small part of its earnings, to virtually unrestricted control of all its earnings by a bureaucracy whose record is one of almost unbroken incompetency and unfairness.

What Does the Public Want?

But this is a very large country and a great deal of it is not included within the precincts of Washington, D. C. Outside of those sacred precincts there are many persons, and many more now than there have been for a very long time, who do not regard the federal government, with all its bureaus and bureaucrats, as an omnipotent holy joss that must be diplomatically placated with orisons to prevent it from devouring the railroads and all the other industries of the country.

The prevailing public sentiment regarding the railway situation, government in business and government expenditures seems, in fact, to afford an almost unprecedented opportunity to turn government and business to the right instead of to the left.

The *Railway Age* believes that in these circumstances the spokesmen of the railways and the railway supply manufacturing interests should go farther or not go as far as they are going. If they are going to advocate "scrapping" of valuation, the rate-making provisions and recapture, then they should go farther and advocate repeal of the Mann-Elkins act and all subsequent legislation conferring upon the commission power to regulate not only railway rates but railway earnings. Probably under present conditions the wisest and most constructive thing Congress could do would be to restrict the commission to the power of merely correcting unfair discriminations in rates which it was given by the Hepburn act of 1906, and thereby restore to railway managements the initiative in making rates and the opportunity to do all they can under prevailing competitive and other economic conditions to restore railway earning capacity.

It may be said that it would be fantastic to propose and hope for such action by Congress. Must we then accept the view that Congress is so determined to ruin the railroad industry that it will neither give the railways opportunity to save themselves, nor, without insistence upon confiscatory recapture of earnings, maintain a rule of rate-making which merely directs the commission to allow the railways as a whole to earn as an average an annual return equivalent to that to which the Supreme court of the United States repeatedly has held that each railroad is entitled and which public utilities generally are allowed to earn? If that actually is the attitude of Congress, there can be no future for the railroad industry excepting government ownership unless the public can be influenced to force a change in the attitude of Congress.

What Should Be Demanded?

The position of the *Railway Age* is that spokesmen of the transportation and business interests of the country should demand that Congress either shall withdraw from the commission all power to regulate railway rates and earnings excepting the power to prevent unfair discriminations, or shall retain in the Act to Regulate Commerce the rule requiring the commission to so adjust rates as to enable the railways of each large group to earn, on the average, a fair return.

All experience has indicated that the commission never will let the railways earn a fair and adequate return unless specifically directed by Congress to do so. The substitution of the so-called "flexible" rule for the present rate-making provisions would be an announcement by Congress that it will not direct, and does not expect, the commission to allow the rail-

ways to earn a fair return in future. The retention of the present rate-making provisions would be an announcement by Congress that it does intend and expect the commission to let the railways earn a fair return. The people of this country do not want government ownership of railways. They want railway earning capacity and credit and progress in the railroad industry revived under private ownership. Those who want this public sentiment made effective should, regardless of temporary conditions and dangers, advocate measures by which it can reasonably be expected to be made effective.

Do Legislators Know Your Interest in the Railroads?

On the communications page in this issue we publish an enthusiastic letter commenting upon the editorial, "Responses to the Call for Volunteers," which appeared in the *Railway Age* of February 20. Our correspondent, a railway supply man, calls upon the whole railway supply industry "from the Schwabs and Vauclains down to the smallest dealer" to come together in "one huge association" to defend the railroads before our legislative and regulatory bodies to the end that all may be brought to see the truth of the slogan: "When the railroads prosper, you prosper." Many of our large cities, he points out, have hundreds of concerns which cater to the railroads and each such city could have its own section of the proposed national association, which would collect and disseminate facts and figures to the public and the legislative authorities.

Don't Rely on the "Other Fellow"

The suggestion merits general attention. If all the good-will which exists for the railroad industry could be made vocal; if all who are dependent upon or interested in the welfare of the industry could, somehow, be led to express to their legislators the opinions they hold privately—then it would be safe to predict that the solution of the railroads' most pressing problems would be rapidly advanced. Too many of the railroads' friends rely on the "other fellow" to exercise the citizen's prerogative of addressing legislators. Speakers exhort others to write or telegraph their congressmen when they themselves have done nothing of the sort. If every man and woman who is intelligent enough to know the facts regarding the present railroad situation, and who has strong beliefs as to what ought to be done about it, should sit down and write his state and national legislators and, through the formation of some such organization as our correspondent suggests, induce others with similar interests

to do the same, then the present plight of the railroads would speedily become a thing of the past.

Condemning legislators is a popular pastime. They doubtless have their faults the same as all of us—perhaps, indeed, some of them may, as general opinion has it, have more. Nevertheless, before we criticize our state or national representatives for failure to deal with national problems as we would have them do, we might well first make sure that we have done our part as citizens by making known to them our desires.

New Fuel Records Set in 1931

Amid the generally disappointing figures recording the results of railway operation in 1931, one gleam of light appears in the annual report of operating statistics just issued by the Interstate Commerce Commission. This arises from the fact that the 1931 unit consumption of railway fuel set the ninth consecutive annual record for increased efficiency in freight service and the eighth consecutive record in passenger service.

In 1923, when a comprehensive program to increase transportation efficiency was adopted by the Association of Railway Executives, 161 lb. of fuel were required in freight service to move 1,000 tons a distance of one mile. This figure was successively reduced each year until in 1931 this same amount of work required the consumption of only 119 lb. of coal, a decrease of 26 per cent. Likewise, the fuel consumed in moving a passenger-train car one mile, amounting to 18.1 lb. in 1923, was cut to 14.5 lb. in 1931, a reduction of 20 per cent.

Reversing these figures to show the amount of work done by a pound of fuel, it is seen that a pound of coal was used in railway freight service to move one ton a distance of 6.2 miles in 1923, while in 1931 one pound of coal moved a ton 8.4 miles, an increase in productivity of 35 per cent. Likewise, in passenger service a pound of coal moved a passenger-train car a distance of 292 ft. in 1923 and 364 ft. in 1931, an increase of 25 per cent.

In the past eight years, calculated on actual train operation and the average prices of coal in the respective years, increased efficiency in the use of fuel in transportation has saved the railways a total of \$446,697,000. Of this total, \$348,661,000 was saved in freight service and the balance, \$98,036,000, in passenger service. Savings in 1931, over the average fuel consumption in 1923, amounted to \$57,733,000. The vital importance of these savings appears from the fact that this 1931 figure represents 65 per cent of the total net income of the railways in that year.

Boston & Maine Completes Large Terminal Project at Boston

Last stage, costing \$4,000,000, and built under heavy traffic, involved four double-track bascule bridges and interesting track and signal work

THE Boston & Maine has now finished the complete revision of its track facilities at North station, Boston, a project which had been under way for the last three years. This project embraced the extension of a cramped station track and platform layout on "made" land, and involved approximately 1,500,000 cu. yd. of filling, and the moving of a river and the construction of four two-track bascule bridges. Suburban coach storage facilities were greatly improved through the construction of a new coach yard and improved connections to two other coach yards; the entire signal and interlocking systems within the area affected were rearranged and modernized; and a track structure was provided which is both unusual in itself and in the manner in which it was designed.

All of this work was confined within an area ap-

proximately two-thirds of a mile long by 550 ft. wide, directly north of the passenger station platforms, within which an eight-track crossing of the old river channel carried more than 1,100 scheduled train and light engine movements in and out of the station every 24 hours. Within the entire area affected by the work there were approximately 1,500 scheduled and unscheduled movements a day, but, in spite of them, the new facilities were superimposed on the old in a minimum of time and without an important train delay.

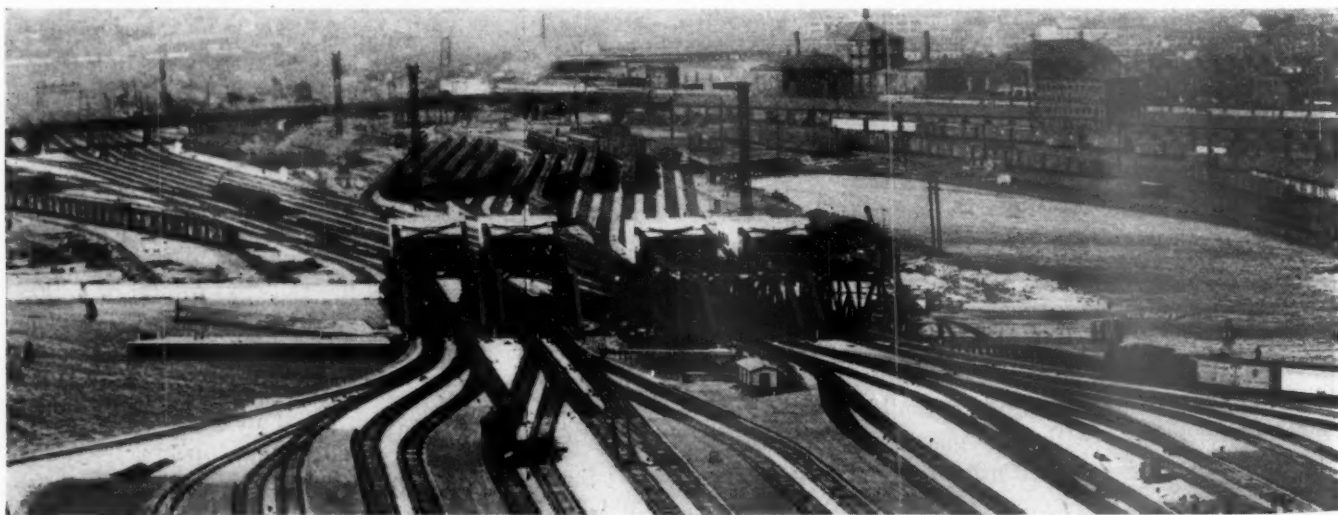
Many Disadvantages in Old Layout

The work described in this article, which cost in the neighborhood of \$4,000,000, is what might be called the last major step in the \$100,000,000 improvement project of the road, a project which was started in 1923 to coordinate and modernize the scattered and, in many cases, obsolete or inadequate facilities of the various small roads which have been combined in the Boston & Maine system. The most recent work was concentrated within a distance of about 3,300 ft., directly north of the 23 platform tracks at the new passenger station, an area which contained an inadequate and poorly located coach yard, designated as No. 1, and a 13-track crossing of the old 40-ft. Charles River channel separating Boston proper from Cambridge, Mass., in this vicinity.

The inadequacy of the coach yard was a major deficiency needing correction, but the greatest obstacle to efficient operation at the station was the position of the old river channel and the steel and timber jackknife bridges which afforded the crossing. In the first



General View of the Track Layout and River Bridges as Seen From the East End of North Station in December, 1930



General View of the Boston & Maine Passenger Terminal Following the Extensive Improvements Made, as Seen from the West End of North Station

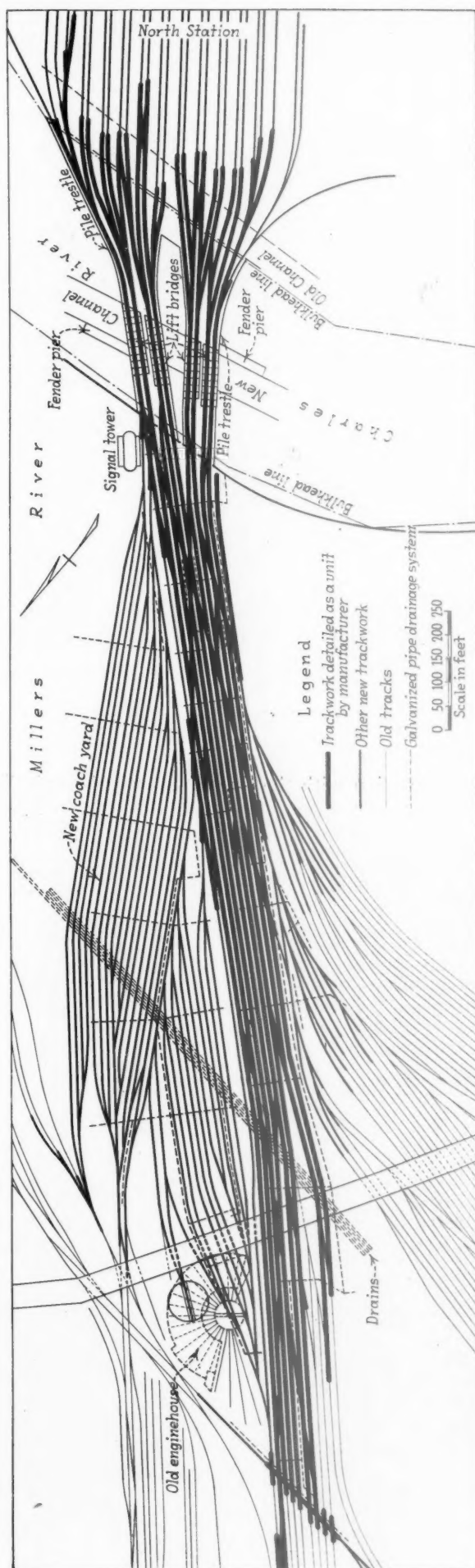
place, the old channel was only 900 ft. to 1,200 ft. from the rear of the station concourse, which limited the capacity of the platform tracks to from 6 to 13 cars with only a few of the longer tracks, and necessitated excessive curvature in the leads to the shorter outside tracks. This situation made it difficult to handle long trains into the station, necessitating the holding of such trains outside the station at times, awaiting the clearing of the few long tracks, and also requiring passengers in the rear cars either to get out on open track and trestle-work beyond the ends of the station platforms, or to walk through the rear cars to the platform. Furthermore, while the 12 track approaches to the station layout would have been more than adequate under proper conditions, their location was such that only 8 of them were effective, and the effectiveness of these 8 was greatly minimized by their position relative to the station track layout and the old coach yard.

The eight-track river crossing carried the eight main lines of the four divisions entering the terminal and connected with all of the 23 station tracks, but it was located out of line with the center line of the platform track layout and was much too close to the station. None of the eight tracks of the crossing had direct connection with the old coach yard, although it was necessary to hold a large number of commuter trains in this yard. Four of the other crossings of the river were grouped together in line with the extreme east side of the station layout, and while they had direct connection with old coach yard No. 1, they were of little real help in that they afforded access to only the five more easterly station tracks, the shortest tracks at the station. One of these crossings served the express facilities along the east side of the station track layout, but the use of the others was confined almost entirely to the movement of a few short empty commuter trains to and from the coach yard. In addition to the two groups of jack-knife drawbridges, interchange movements with the Union Freight Railroad and some industrial switching were handled over a single-track draw span located east of the passenger drawbridges.

Details of New Work

In the recent work, the channel of the river was moved 350 ft. further from the station, and widened to 65 ft., and the eight main crossings of the old channel were made to give way to a new group of eight crossings in a greatly improved alinement, which has largely reduced the curvature to the outside station tracks. Furthermore, the area between the south side of the new channel and the outer ends of the old station tracks, which was practically all trestlework over water heretofore, was filled in to provide a permanent roadbed.

As a result of these changes the capacities of the different station tracks was increased to from 13 to 16 cars, with the exception of a single eight-car track and the capacity of the station tracks as a whole was increased from 190 cars to 300 cars. With this increase in the capacities of the individual tracks, the passenger platforms at the station have been extended to accommodate full train lengths. These extensions have been made of wood treated with zinc-meta-arsenite, and are without sheds, awaiting settlement of the newly filled area. At a later date, it is planned to reconstruct the platform extensions and to cover them with butterfly-type shelters. As a further result of the changes made at the terminal, there will be no necessity in the future for holding long trains outside the station awaiting track space, since these trains can now be handled on any one of a large number of tracks.



In effecting the new layout, old coach yard No. 1 was torn up and the easterly group of four bridge crossings of the old channel was abandoned and filled in. Replacing the old coach yard, a new two-unit, double-end yard, with 22 tracks and capacity for 155 coaches, was constructed, beginning about 500 ft. north of the new channel crossing, and was provided with



Looking Over the Site of the New Bascule Bridges, Showing the Mass of Old and New Timber Involved

direct connection with the five more easterly main-line tracks of the crossing. In addition, four new freight interchange tracks, with capacity for 106 cars, were installed along the east side of the new coach yard and were provided with direct connection with the easterly main track over Span No. 1, thereby permitting abandonment of the old single-track draw. Through the location of the new coach facilities, every foot of the new yard is effective as storage space and all train movements between the station tracks and the yard are direct and of minimum length.

Supplementing these changes, the entire track layout for about 2,400 ft. north of the new crossing has been completely revised, providing the greatest flexibility in movement, not only over the main lines, but also to the other two coach yards lying west of the main line, about 1,000 ft. north of the river, and to another coach yard in East Somerville, about 3,000 ft. north of the river.

Four Two-Track Bascule Bridges

Relieving the 13-track crossing of the old river channel on old jack-knife bridges, a battery of four new two-track, single-leaf Scherzer bascule spans was constructed across the new channel, this type of span having been selected because of economy and the unrestricted overhead clearance which it affords. The new draw spans, which are numbered consecutively from 1 to 4, beginning with the most easterly span, were designed in pairs, Spans 1 and 2 being identical, with lengths of 97 ft. 1¼ in. center to center of bearings, while Spans 3 and 4 are similar, with lengths of 87 ft. 9¾ in. center to center of bearings. All four spans are motor-operated, Spans 1 and 2 each being equipped with two 60-hp. General Electric M. T. C. 440-volt, 60-cycle, wound rotor motors, while Spans 3 and 4 are equipped with motors similar to those in

Spans 1 and 2, except that they develop only 50 hp. each. The motors on each span are located in a machine room provided on the span side of the concrete counterweight.

Normally, each span is operated by both of its motors, but in the event of a failure of one motor, it can be operated by the other alone, the only effect being that the normal speed of 58 sec. for opening or closing the span is slightly decreased. The power supply for the operation of the spans is obtained from two different sources, through separate power lines, which are made to pass through automatic oil circuit breakers so that a failure on one line will not cause an interruption in the operation of the spans. As a precaution against delay through a complete power failure, each span is equipped with a gear and chain mechanism whereby the span can be operated manually.

The electrical operation of the four spans is controlled by four separate controllers located on the second floor of the new signal and interlocking station nearby, thus affording an unobstructed view of the spans during operation. The controllers are fully interlocked with the new signal and interlocking system provided at the terminal.

All four bridges rest on concrete piers or footings with steel shells, there being four individual piers under the roller end and two under the lift end in each case, except in three instances where one extra-large pier was made to take the place of two of the smaller ones which would have come too close together. All of the smaller piers are cylindrical in shape and from 6½ ft. to 9½ ft. in diameter, while two of the double piers are 16 ft. 2 in. long by 6 ft. 6 in. wide, in section, and the third is approximately 17½ ft. by 9½ ft., in the shape of a bathtub. All of the piers were carried down to rock by open dredging, the depths reached ranging from 30 ft. to 53 ft. below mean low tide. Old piling had to be pulled in order to place most of the piers, but the greatest difficulty encountered was the presence of massive timbers from long-forgotten structures, deep below the river bed, which, in several cases, necessitated the use of a diver with a saw to remove them.

With new bulkhead lines established by the War department, 375 ft. apart throughout the width of the track crossings, it was necessary to construct about 400 lin. ft. of ballast deck pile trestle to reach the new bridges over the new channel, which was located about midway between the bulkhead lines. The trestle-work, which is fan shaped on each side of the channel to carry the expanding track system immediately on each side of the crossing, involved the driving of approximately 2,500 creosoted long-leaf yellow pine piles ranging in length from 50 to 65 ft. The bracing and deck of the trestle are likewise of creosoted material, and involved the use of approximately 970,000 ft. b.m. of timber.

All of the material used in the trestle approaches was handled through the plant of the New England Wood Preserving Company at Nashua, N. H., where it was preframed before treatment. Because of the congestion of facilities and operations at the terminal, the treating plant also performed storage service for the railroad, holding all ties, piling and timber until specific shipping orders were received. In this way, only materials for a few days' requirements were ever on hand at the terminal to add to the existing congestion, and the road was relieved of considerable in the way of rehandling costs.

The construction of the new trestlework on both sides of Spans 3 and 4, and particularly on the south side,

was made unusually difficult by the fact that in many cases old piling interfered with the placing of new piles, which necessitated the pulling or cutting off of the old piles. A further complication was the fact that the bents and stringers of the new trestlework were at entirely different angles with the channel than those of the old pile structure, a situation which made it particularly awkward since it was necessary to build the new structure in narrow sections, and each time to extend it into that part of the old structure still retained in service.

The sea wall provided on both bulkhead lines consisted of several courses of large granite blocks within the tidal range, supported on treated timber piles and surmounted by a concrete cap wall. While the walls were relatively simple in themselves, their construction was one of the most awkward and interrupted pieces of work in the entire project. Within the area of the tracks, the walls were built only as tracks could be taken out of service temporarily, and it was seldom possible to build a length at one time corresponding to more than the width of two tracks.

The greatest difficulty in the construction of the walls occurred in connection with the south side wall where it intersected the bearing lines of several of the old jack-knife bridges. Here it was necessary to dismantle the old bridges temporarily as their tracks were taken out of service, and then to replace them after the lower part of the wall had been constructed. The completion of the sections of wall in this area was not possible until the new bridges had been finished and the new channel opened.

Special Trackwork Construction

The track work was one of the most exacting phases of the entire project, as hundreds of changes or new installations were necessary in connection with the constantly changing aspect of the other phases of the work. In the final layout there are approximately 13 miles of new tracks, 18 No. 8 double-slip switches, 107 Nos. 8, 9, 10 and 12 turnouts, 3 No. 10 double crossovers, and 11 crossing frogs, 9 of which are involved in a single-track crossing of 9 tracks. With the exception of approximately 46,000 ft. of tracks laid with 85-lb. and 100-lb. rail and approximately 30 turnout switches laid in and about the coach yards, the track material is 130-

lb., the heavier material being used exclusively in all main lines and main line connections.

With a definitely limited amount of time for each specific change, large forces of men were employed, supplemented by much of the track-laying equipment available on the road, including cranes, ballast cars, Jackson power ballasters, Nordberg power jacks and track shifters, and numerous pneumatic tie tamping outfits. Working with the aid of floodlights at night as required under the strenuous program set up, the new ties, rails and special trackwork were unloaded close to the points of installation. Cranes set the rails directly in the tracks where possible, and the new doubleslips were rolled or lifted into place as units whenever available room near the points of installation made it possible to assemble them in advance.

The track structure provided throughout the entire throat of the station consists of creosoted oak ties; 130-lb. heat-treated rail, except in tangent tracks where 130-lb. medium manganese rail was used; and heat-treated turnouts and double-slip switches, except for the frogs, which, in all cases, are of the solid manganese self-guarded type. In the case of the group of nine diamond crossings at the extreme north end of the work, where the Hoosac Wharf line crosses two enginehouse leads, six main line tracks and a yard lead, three of the crossings are of the bolted type with heat-treated steel throughout, while the other six are of solid manganese construction. An entirely new foundation was provided under the crossings, consisting of a series of 15-in. reinforced concrete slabs on a 4-in. cushion of cinders, in accordance with the recommendations of the A.R.E.A., surmounted by 10 in. of crushed stone carrying a layout of long, treated ties placed diagonal to the crossing tracks themselves. Furthermore, the entire line of crossings is subdrained by a line of 12-in., perforated, corrugated iron pipe.

All of the new 130-lb. trackwork was designed and furnished by the Bethlehem Steel Company in accordance with a base-line plan furnished by the railroad, showing the track arrangement desired on a scale of 50-ft.-to-the-inch. From this plan the steel company prepared detailed plans of the layout and of each individual unit of special trackwork, and then fabricated and assembled the different units in its shops to insure their accuracy of assembly in the field. Copies of the



Interior of the New Signal Station Showing the New 211-Lever Electro-Pneumatic Interlocking Machine

assembly plans, which were made $\frac{3}{16}$ in. to the foot and with every unit and separate piece numbered, were furnished to the railroad, and, as called for by the railroad, the specific units of trackwork, with each piece of steel marked in accordance with the plans, were shipped together, separate cars being used for the various slips and turnouts as designated by the railroad.

In installing the different units, the final locations were staked out in accordance with information on the plans furnished by the steel company, and then checked against the base lines which had been established through the terminal. The ground at each location was then graded to within about two inches below the bottom of the switch timbers, the timbers were laid out in their proper positions, and the various parts of the turnouts or slips were unloaded on the timbers and connected up.

Extensive Drainage System Provided

In order to afford proper drainage for the expansive new layout of tracks, an extensive system of subdrainage was installed north of the drawbridges, with a total of 185 catch basins carefully located to insure the rapid and complete run-off of water from around all switches, crossovers and other units of special trackwork. The main problem in this regard was that the drainage was necessary largely in the 1,092,000 sq. ft. of filled-in area at the terminal, where the fill, which was made of a wide range of materials, had not become entirely stable. This difficulty was overcome by using Armco corrugated iron pipe, which provided the necessary flexibility in the drainage lines whereby they could adjust themselves with such settlement as might occur, without damage to the pipe or the drainage system.

Altogether, 7,030 lin. ft. of 12-in. and 1,360 lin. ft. of 18-in. 16-gage galvanized culvert pipe was used in the system, which also included 19 brick manholes 8 ft. deep, and 185 catch basins, made up of two three-foot lengths each of Massey concrete culvert pipe, two feet in diameter. The 12-in. corrugated pipe, with catch basins between tracks and at special points requiring drainage, was used as laterals, while the 18-in. pipe, with manholes at intervals, was used to carry the collected run-off.

The drainage system was installed by the open trench method, largely by hand labor. Adjoining lengths of pipe were secured together by means of Armco corrugated connecting bands. Throughout the system, a pitch of 3 in. in 100 ft. was provided, and a minimum distance of 15 in. was allowed between the top of the pipe and the bottoms of the ties.

New Signal and Interlocking Systems

The new signal work at the terminal included the provision of new electro-pneumatic switch movements throughout, replacing old switch machines of the same type; the complete installation of new dwarf color-light signals of the searchlight type, replacing old semaphore signals; and the concentrating of the control of all switch and signal movements in a new signal station, designated as Tower A, along with the bridge controls. All of the new signal equipment was furnished by the Union Switch & Signal Company.

The new signal station, which replaces two old towers, A and B, is a two-story steel-frame brick structure, located immediately northeast of draw span No. 1. The upper floor houses a new interlocking machine with a total of 211 levers, 189 of which are in use at present and control 161 signals, 97 turnouts, 18 double-slip switches and the locks on the four bridge spans.

This floor also provides space at its south end for the four draw span controllers, in a position where unobstructed view can be had of the spans at all times. The lower floor of the station is used mainly as a relay and battery room, housing several hundred relays and several sets of Exide storage batteries, as well as the power switchboards for the bridge control circuits, and provides space for signal maintainers headquarters.

In the new signal layout, the wiring system is sectionalized through the construction of seven junction and relay houses about the terminal area, these houses being of sheet metal construction, 5 ft. by 7 ft., and set directly at the track level. All wiring between the new signal station and the relay houses is carried in lead-covered cable, and all connections between the relay houses and the switches and signals is by means of Parkway cable.

One of the most interesting phases of the signal work was the fact that electro-pneumatic operation of practically all switches was maintained throughout the terminal work, with tower control also of practically all signals. This involved considerable rewiring work and the relocating of from 3,000 to 4,000 ft. of main air lines, with constantly changing connections to switch machines, but proved far more economical and effective than the employment of numerous switch tenders over the many months of the work.

During the work, old Signal Tower A, a three-story frame structure with a 131-lever interlocking machine on its top floor, was moved eastward a distance of 35 ft. to make room for essential track changes. This was effected while the tower was in full operation and was done so smoothly that it is said that the tower operators were unaware when the move was actually being made.

To prepare the tower for movement necessitated the splicing of about 640 wires and cables, and the lengthening with flexible hose of the hot and cold water and air piping into the building. The actual moving of the tower, which was particularly difficult because of the fact that practically all of the weight was concentrated on the top floor, was done by means of rollers and a hand winch, and required only about 3½ hours. The entire work involved in the move required about six days.

Success Hinged on Careful Planning

While the new facilities provided in the terminal layout are of interest in themselves, they are of particular interest because of the unusual problems which were encountered in superimposing them on a congested layout of old facilities subject to heavy traffic. Practically every phase of the work presented special problems, but, through the skill exercised in the formation and execution of plans and, in no small measure by reason of the close co-operation which existed at all times between the different departments of the road, all of these problems were surmounted most effectively. That this was the case is shown by the speed and smoothness with which the work was carried out, and by the further fact that few trains were delayed.

Following a carefully drawn up plan of the new arrangement desired, the work as a whole was divided into two main parts, and each part was then carefully programmed, with colored plats and charts to show the sequence and progress of operations. The first part of the work was confined largely to the area between and including the old and new bridge sites. In this part, work on the substructures of the four draw spans was done when and where it would best fit in with train operations, but work on the sea wall and trestlework

was prosecuted uniformly from the east toward the west, taking two tracks out of service at a time where necessary, and always providing new lead arrangements to the station tracks.

With the completion of the first main phase of the terminal work, during the course of which a large amount of the temporary track work was carried on in the new coach yard north of the new bridge sites, the stage was set for the construction of the draw spans themselves. This work, together with the track work involved, was divided into 10 separate stages. Stages 1 to 4, inclusive, witnessed the completion of Spans 1, 3, 2 and 4 in the order given, as well as the completion of the new coach yard and a large part of the outlying trackwork, and Stage 5 saw the first of the major main track changes which were to route the more westerly of the main tracks over Spans 3 and 4.

In all of this work, Stage 5 was the most critical in that it affected practically all main-line operations. This stage, which was started at midnight on Friday, July 31, and completed by 6 a. m. Sunday, August 2, included the dismantling of the superstructures of four of the old draw spans; the construction of a 120-ft. temporary filling trestle; numerous track changes at the entrance to the station tracks and at the entrance to the new coach yard; and a large number of main-line changes. The track work involved the removal of 9 double-slip switches, 8 turnouts and approximately 2,850 lin. ft. of tracks; the relocation of 6 turnouts; the building, rebuilding or lifting into place of 11 turnouts; and the rolling into place of 2 double-slip switches.

Beginning August 1, the river channel was closed to shipping for 5 days and work was rushed in clearing and dredging the new channel and in filling the old channel. The rapidity with which this work proceeded is seen in the fact that the railroad made the change and opened the new channel to traffic in one-half the time allowed by the War department, and through the further fact that approximately 100,000 cu. yd. of the 178,000 cu. yd. of filling necessary was placed in a week's time. This latter work was done with six trains of Magor 30-yd. and Western 16-yd. side dump cars, which were loaded by three 3½-yd. shovels, two of which were in constant operation in what remains of McLean Asylum hill, directly within the Boston & Maine's freight terminal area.

On August 6 the new river channel was opened to traffic, and on August 16, main-line train service was established over Span 2. The work remaining after that date consisted largely of finishing operations, including the burning off and removal of the top sections of the old channel spans, the completion of the unfinished sections of the south side sea wall, the completion of the filling operations, and numerous track adjustments and refinements.

All of the work described was carried out in accordance with general plans designed and developed under the direction of W. J. Backes, chief engineer of the Boston & Maine, and W. F. Cummings, assistant chief engineer. The stage plans, under which the work was carried out so successfully, were developed under the direction of H. F. Fifield, engineer maintenance of way, and T. G. Sughrue, division engineer of the Terminal division. The actual track and bridge work was carried out under the general direction of Mr. Fifield and under the direct supervision of Mr. Sughrue. J. P. Muller, signal engineer, was in charge of all signal work.

The four bascule bridges were designed by Keller & Harrington, Chicago, under the direction of Mr. Backes and B. W. Guppy, engineer of structures of the Boston & Maine, and E. W. Wiggins, consulting engi-

neer, while the steelwork was fabricated and erected by the Phoenix Bridge Company, Phoenixville, Pa. All of the signal and track work was done by company forces, while the bridge piers, the sea walls, the approach trestles, and a number of other items of work were done by T. Stuart & Sons, general contractors, Watertown, Mass. The electrical installation in connection with the drawbridges was handled by the Norwood-Noonan Company, Chicago.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended February 20 amounted to 572,606 cars, an increase of over 10,000 as compared with the week before. This was, however, a decrease of 140,550 as compared with the corresponding week of last year and of 254,954 as compared with 1930. Loading of grain and grain products showed an increase of 61 cars as compared with the corresponding week of last year and of over 8,000 cars as compared with the week before, presumably because of movements expedited because of the restoration of higher grain rates in the West on February 20. The summary, as compiled by the Car Service Division of the A.R.A., follows:

Revenue Freight Car Loading

Districts	Week Ended Saturday, February 20, 1932		
	1932	1931	1930
Eastern	132,223	163,324	189,295
Allegheny	113,818	146,667	170,998
Pocahontas	36,021	42,622	50,476
Southern	84,981	108,651	134,939
Northwestern	66,461	88,057	96,272
Central Western	91,510	105,450	117,350
Southwestern	47,592	58,385	68,230
Total Western Districts	205,563	251,892	281,852
Total All Roads	572,606	713,156	827,560
Commodities			
Grain and Grain Products	40,927	40,866	41,948
Live Stock	18,934	22,181	23,207
Coal	112,070	136,112	156,784
Coke	6,191	8,647	11,647
Forest Products	19,410	33,822	56,220
Ore	3,139	5,134	8,911
Mdse. L.C.L.	188,077	215,446	219,430
Miscellaneous	183,858	250,948	309,413
February 20	572,606	713,156	827,560
February 13	562,465	720,689	893,140
February 6	574,756	719,053	886,701
January 30	561,157	719,397	898,835
January 23	562,938	715,474	862,346
Cumulative total, 7 weeks	3,979,702	5,026,109	6,078,198

Car Loading in Canada

Car loadings in Canada for the week ended February 20, amounting to 42,593, increased over the previous week's by 1,537 cars. Grain increased by 1,294 cars, pulp and paper by 134 cars, other forest products by 293 cars, merchandise by 126 cars and miscellaneous freight by 382 cars. Coal decreased by 447 cars, and ore by 201 cars. Compared with loadings for the seventh week last year, total loadings were less by 5,442 cars, or 11 per cent. The index number of total car loadings showed a rise for the second consecutive week, rising from 70.11 for the fifth week to 71.12 for the sixth week and to 72.79 for last week.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
February 20, 1932	42,593	22,611
February 13, 1932	41,056	22,264
February 6, 1932	40,040	20,738
February 14, 1931	48,035	28,995
Cumulative Totals for Canada		
February 20, 1932	283,391	145,740
February 14, 1931	317,173	188,295
February 15, 1930	384,459	252,441

How the Baltimore & Ohio Handles Scrap

Sales yield over \$2,500,000 yearly—Simplified practice
and accounting avoid waste—Reclaim at source—
Sort for 50 cents per ton

By E. W. Walther

General Storekeeper, Baltimore & Ohio

EVERY railroad has a scrap problem and every one has solved the problem in its own way. On the Baltimore & Ohio, we have a system which, while perhaps not as elaborate as on some other railroads, is believed to be the most economical that could be devised for our conditions. Almost every part of the railroad contributes to the scrap pile. The relaying of tracks, the repair or replacement of bridges, the construction of freight and passenger stations or other structures, the maintenance of tunnels, right of way, signal and telephone lines, etc., are a few of the many operations on the physical property which contribute to a steady flow of scrap to the scrap yard. Repair tracks, shops and terminals produce a heavy tonnage of worn-out castings, forgings and other metals, as well as a quantity of less valuable scrap such as lumber. All of this scrap has value. The sale of it during the calendar year 1930 averaged \$209,224 per month. This does not include the large quantity used in our own foundries and forge shops.

Many Kinds of Scrap

For use in preparing and reporting old material for sale, the company has a scrap classification which provides over 60 different assortments of scrap. The classification has been in existence much longer and differs in some respects from the classification adopted by the American Railway Association. While, as will be explained later, it does not follow that all scrap is sorted into all these classes, the classification shows the range in the kinds of scrap resulting from the normal operation of the road.

The classification and the amount of each class of scrap sold in 1929 are as follows:

Class	Item	Sold in 1929 (Gross Tons)
1	Arch bars, transoms and coupler yokes—Iron and steel	
2	Axles, No. 1—Iron..... Wrought-iron axles, both car and locomotive, under 6 in. at center	
3	Axles, No. 2—Steel..... Steel axles, both car and locomotive, 6 in. dia. and over at center	
4	Axles, No. 3—Steel..... Steel axles, both car and locomotive, under 6 in. dia. at center	
5	Axles—No. 4—Steel axles, hollow bored.....	
6	Boilers and fireboxes, uncut..... All kinds of boilers with and without flues Fireboxes and part fireboxes may be included	525
7	Boilers and fireboxes, cut up..... Iron or steel boilers and tank plates cut into sheets and rings. Quartered boilers admissible; also cut fireboxes with staybolts attached	2,030
8	Railroad cast—No. 1..... Pieces weighing 150 lb. or less, including new grates, new stove plate, clean cast-iron culvert, soil and water pipe, to be free from brake shoes and all burnt castings	745
9	Railroad cast—No. 2..... Pieces weighing over 150 lb.; otherwise same classification as Class 8. Includes cast-iron cylinders and cast-iron driving wheel centers and other castings that can be broken under a drop	2,205

Class	Item	Sold in 1929 (Gross Tons)
10	Railroad cast—No. 3..... All kinds of burnt castings, including burnt grates, frames, and stove plate	1,140
11	Railroad cast—No. 4..... Cast-iron brake shoes with wrought-iron or steel backs, free from composition brake shoes	1,355
12	Steel couplers, knuckles and locks.....	2,912
13	Frogs and switch points, uncut..... All frogs, switches, and crossings not cut apart	4,295
14	Frogs, Manganese steel, uncut..... State percentage of steel rail attached	205
15	Flues, tubes and pipe—Wrought iron and steel, ungraded	2,835
16	Structural and bridge iron.....	
17	Uncut structural and bridge steel..... All steel from bridges and structures not cut apart; also all kinds of uncut bolsters, brake beams, steel trucks, underframes, channel bars, and steel bridge plates	18,067
18	Malleable scrap..... All kinds of malleable castings from railroad equipment	3,020
19	Steel rail—No. 1..... All steel rail over 5 ft. in length	76,511
20	Steel rail—No. 2..... All steel rail under 5 ft. in length	3,493
21	Sheet scrap..... Under 3/4 in. thick. Includes cut smoke stacks, hoops, band iron and steel, pressed-steel band car wheels, shovels, wire rope, cushion springs, galvanized iron, tin, wire and composition brake shoes	2,803
22	Spring steel..... All heavy coil and elliptic springs and spring steel	2,530
23	Cast steel—No. 2..... All steel castings over 18 in. wide and over 5 ft. long. Includes cast-steel truck and body bolsters, side frames, wheel centers, and cast-steel and wrought-steel and locomotive frames	4,480
24	Heavy melting steel—No. 1..... No scrap under 3/4 in. in thickness, over 5 ft. long, or over 18 in. wide. Includes steel castings, angle bars, rail joints, tie plates, chain, carbon tool steel, files, punchings, plate shearings, bolts, nuts, spikes, rivets, pins, axle butts, and other forgings, coming within the above dimensions. Steel rail under 5 ft. in length admissible.	44,758
25	Heavy melting steel—No. 2..... Includes structural steel beams, girders, columns, channels, and forgings from car and locomotive equipment, over 5 ft. in length, nothing over 12 in. wide, cut apart so as to be easily sheared	415
26	Steel tires..... All locomotive and car tires	1,752
27	Turnings, drillings and turnings and borings..... Wrought, cast, and steel mixed with other metals	5,093
28	Wheels, No. 1..... All solid cast-iron car and locomotive wheels except driving wheels	19,682
29	Wheels, No. 2..... All rolled, forged, and cast-steel car, tender and engine truck wheels	1,455
30	Destroyed steel cars..... Car bodies Burnt scrap from destroyed equipment Air reservoirs Unassorted scrap	19,680 27,506 2,910 110 1,711
Non-Ferrous Materials		Lb. Sold
31	Babbitt—Clean.....	
32	No. 1 brass..... Locomotive brass, including rod brass	
33	No. 2 brass..... Steam metal brass, including valves and fittings	9,000
34	No. 3 brass..... Journal bearings, free from babbitt	
35	No. 4 brass..... Brass borings, turnings and drillings	
36	No. 5 brass..... Yellow brass castings, including brass hose couplings, etc.	80,500
37	No. 6 brass..... Coach trimmings and light brass	8,700
38	No. 7 brass..... Condenser tubes, all lengths	1,200
39	White metal.....	45,000
40	Aerial copper cable—Insulated.....	

Class	Item	Lb. Sold
41	No. 1 copper..... Wire, free from insulation, flue ferrules, pipe, hammer heads	2,000
42	No. 2 copper..... Sheet copper and roofing, free from paint and nails	.....
43	No. 3 copper..... Roofing copper with paint and nails	1,100
44	No. 4 copper—Battery copper.....	3,700
45	No. 5 copper..... A—Dross B—Oxide	1,200
46	Lead—Battery	18,000
47	Lead	11,000
	Sheet, pipe, etc.	.....
48	Sediment .....	.....
	Battery box	.....
49	High-speed steel.....	.....
50	Zinc	18,850
	A—Sheet B—Oxide	.....
51	Barrels .....	.....
	Alcohol, carbon oil, dynamo oil, engine oil, fuel oil, gravity oil,—32 deg., grease—one head, linseed—raw, linseed—boiled, paint, paint—one head, smoke-stack black, turpentine, varnish	.....
52	Bags and burlap.....	36,900
	Bagging, sacking and waste covering	.....
53	Canvas .....	.....
54	Carpets, linoleum and plush..... Specify kind: A—Carpet; B—Linoleum; C—Plush	5,050
55	No. 1 leather..... Belting, 6 in. and over in width	.....
56	No. 2 leather..... Belting, under 6 in. in width, punchings and trimmings	.....
57	No. 1 rope..... Manila rope, free from bow fenders	14,800
58	No. 2 rope..... Manila bow fenders, tarred rope and marlin Kind specified	.....
59	No. 1 rubber.....	180,000
	Air-brake, signal hose free from wire and fittings	.....
60	No. 2 rubber.....	60,000
	Steam and water hose, free from wire and fittings	.....
61	No. 3 rubber..... Engine tank and washout hose, free from wire and fittings	.....
62	No. 4 rubber..... All wire-wound and wire-inserted hose, including oil and paint hose	.....
63	No. 5 rubber..... Rubber packing, gaskets, diaphragms, matings and step treads, etc.	.....
64	No. 6 rubber..... Rubber-lined fire hose	.....
65	No. 7 rubber..... Valves of all kinds	.....
66	No. 8 rubber..... Rubber belting of all kinds	.....
	Foundry ashes.....	25,000
	Grindings, emery wheel, brass.....	4,800
	Rags	5,950
	Skimmings, foundry.....	1,374,000
	White metal dross.....	27,500
	Aluminum and lead shavings, small per cent steel.....	19,000
	Brass, small per cent iron.....	94,000
	Iron, small per cent brass.....	67,300
	Magnet, tailings.....	86,000
	Die cast metal, small per cent aluminum and zinc.....	2,450
	Copper fire extinguisher cans.....	2,000
	Red metal packing.....	41,000
	Yellow brass borings.....	51,000
	Aluminum shavings.....	900
	Copper pipe with brass fittings.....	2,500
	Copper pipe with zinc attachments.....	200
	Copper pipe with approximately 20 per cent brass attachments	3,500
	Ferrous scrap sold	254,223
	Other scrap sold.....	1,029
	Scrap used	25,738
	Total scrap produced.....	280,990

It will be noticed that no scrap in Classes 1 to 5, inclusive, was reported for sale in 1929. These classes of scrap were used entirely by the company in its own foundries and shops. Neither were there sales of scrap in 19 other classes, including various kinds of non-ferrous materials. This was also because the scrap was retained for use by the company or because none was produced.

Based on the shipments made, the tonnage of scrap produced on the Baltimore & Ohio in 1929 was 280-990 gross tons. The scrap sold consisted of 254,223 gross tons of ferrous and 1,029 gross tons of non-ferrous scrap, while the scrap used at the road's own foundries, etc., amounted to 25,738 gross tons. The figures for 1929 are more truly representative of operations than those for 1930 or 1931.

Simple Methods Followed

In handling the scrap, economy and simplicity are the watchwords all along the line. There are no fussy records nor elaborate accounting practices. We do not at-

tempt to keep track of individual items of material. The assumption is that all scrap will ultimately find its way into the scrap; therefore, the shop men do not deliver the scrap, other than brass, to the storehouse when taking out new material. The fact that the using departments must absorb the inventory adjustment each year, whether debit or credit, has been a factor in regulating the practice. It is recognized, for instance, that if the mechanical department should succeed in "putting one over" on the storekeeper in some transaction, that department is only prolonging the day of reckoning. Therefore, the stores department, which handles the accounting for all scrap, allows a scrap credit on the requisition, or material card, when a shop man obtains new material from the storehouse. This credit is computed from a carefully-prepared list of percentages, which is issued on printed form over the signatures of the chief of motive power and equipment, the comptroller and the general storekeeper. It is the duty of the storekeeper to allow credit in accordance with this circular, regardless of whether or not claim is made.

New Material Issued

	Credit Allowed for Scrap Material
All wrought iron, except borings and turnings..	90 per cent
No. 1 cast iron and malleable iron.....	90 per cent
Brake shoes.....	25 per cent
Burnt castings and grate bars.....	75 per cent
Springs	100 per cent
Tires	Actual weight
Steel castings.....	90 per cent
Pressed steel.....	65 per cent
Copper	Actual weight
Brass borings and turnings.....	Actual weight
Brass	Actual weight
Lead and babbitt metal.....	Actual weight
All manufactured articles, such as boiler trimmings, A.R.A. couplers and similar articles..	Actual weight

It will be noticed that this schedule is based on the reasonable amount of loss expected due to machining or wear and represents the weight that a new part will yield as scrap. The one exception to the rule is the credit allowed on brass. Brass scrap is carefully weighed by the storekeeper and credit given daily.

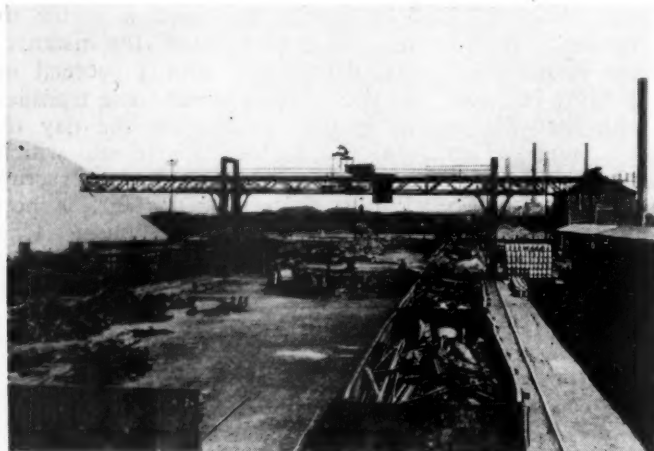
Direct Shipping Favored

All mechanical scrap is gathered and delivered to the stores department by the shop forces. Scrap originating in the shops is gathered in pans and delivered to the scrap car or storehouse by lift trucks. Scrap cars, when fully loaded, are consigned to the nearest scrap yard for re-handling. Line of road scrap, excepting scrap rail, is accumulated at tool houses and gathered up by the supervisor with a car carried on a supply train, when operated, or on a local freight train. The car is then consigned to the nearest scrap yard. Scrap rail is accumulated on the ground, reported for sale and loaded when sold, being consigned direct to the scrap dealer from the division without further handling. Approximately 100,000 tons of scrap, or over 35 per cent of the total tonnage handled, was shipped direct from origin to final destination in 1929. The saving in ton-miles and handling costs by moving the scrap in this way is considerable.

Few Men at Scrap Yards

Scrap yards are maintained at Baltimore, Md., Pittsburgh, Pa., and Cincinnati, Ohio, serving the Eastern, Central and Western zones, respectively. There are no elaborate facilities at these yards. The normal forces consist of 12 men at Cincinnati, 14 at Pittsburgh and 16 at Baltimore. The sorting space is located between inbound and outbound tracks and the unloading

and loading of scrap is accomplished with the use of cranes. A heavy power shear and an acetylene torch outfit complete the equipment. Sorting pans are used and are, as a rule, home made, consisting usually of



wide and 100 to 200 ft. long. Scattering the scrap in a low pile facilitates handling and promotes more rapid assorting. At the same time, it eliminates the necessity of pulling the scrap down from a height which would not only slow up the sorting but add an element of danger in the risk of accident or injury to the men. Sorters place this scrap in the designated pans. Heavy items, such as couplers, cylinder heads, etc., are picked up by the crane with the aid of chains, thereby eliminating heavy lifting which would slow up the operation.

Scrap
Sorting
at
Pitts-
burgh

An effort is made to hold a sale certificate at all times for each class of scrap accumulated, so that the pans of sorted scrap can be dumped at once into waiting cars, which eliminates storage on the ground with consequent rehandling. Some classes of scrap accumulate slowly and must be piled on the ground, but this is the exception rather than the rule. Often certain classes of scrap are sold before they are actually on hand, but the



The Average Car is Sorted in 10 to 12 Classes

quartered sections of old fireboxes, boilers or storage tanks. At the Baltimore and Cincinnati yards, locomotive cranes, equipped with magnets, are used. These cranes are also used in a limited way for switching. The yard at Pittsburgh is equipped with a gantry crane.

A description of the operation at Pittsburgh will give a general idea of the method used at all three scrap yards. All inbound scrap cars for unloading are placed on a track on one side of the yard, while empty, light-weighted cars are spotted on the opposite track. The pans for the sorted scrap are placed in two parallel lines between these tracks. All pans are marked to show the kind or class of scrap and, where a certain class of scrap, such as heavy melting steel, accumulates more rapidly than others, more than one pan is assigned to that class. The unassorted scrap is unloaded by magnet and scattered in the center of the yard between the pans. This scrap is usually scattered over a space from 8 to 10 ft.

Pans
Are
Handled
by
Crane



storekeeper, by constantly keeping in close touch with the scrap situation is able to estimate the probable accumulation from 30 to 60 days in advance, and the instances where delivery cannot be made as promised are rare.

During normal business, the crane works in two shifts. On the first shift where all the scrap is sorted, the crane assists by handling items that cannot be moved by hand. All loading and unloading, as well as the pulling and spotting of cars, are performed during the second shift. This eliminates any possibility of disturbing or holding up the assorters.

When sorting such items as flues, pipe, long rods, channels, angles and similar articles, it is customary to place two car chains on the ground and lay the articles on them. It is then a simple operation for the crane to pick up the load and carry it to the shear or load it into the waiting cars. If no car is available, the sorted scrap is held in the pans until a car is placed, when the crane picks up the pan and dumps it into the car. This method eliminates the necessity of handling the scrap more than once by hand, and it is not necessary to hold up the assorting work for cars.

Sort Scrap Without Unloading

The contents of the average car of scrap shipped to the scrap yards are sorted into 10 or 12 different classes of material, which operation requires unloading, but frequently it is possible to transfer scrap from one car to another without placing it on the ground. This is particularly common with track scrap. The loaded car is placed next to an empty one and the heavy melting steel is transferred by the crane magnet. Two men are assigned to each car to throw out the scrap that does not belong in this class. It is thus often possible to transfer a 40-ton car and obtain from 30 to 35 tons of heavy melting steel, under load, without the scrap having touched the ground. It is estimated that 7,700 tons of scrap are prepared for sale in this way annually. The economy of the method is obvious.

Preparation of Scrap Limited

Another profitable practice, carried out at all the scrap yards, is the conversion of one class into another. By using shears and acetylene torches, Classes 17, 23, 25 and 30 can be readily converted into Class 24. The increase in the value of this scrap usually justifies the operation. A report selected at random covering operations during one month at the Baltimore yard revealed the fact that 56 tons cut by shear and 78 tons cut by torch resulted in a gain in value of \$276 and \$298, respectively, or a total net increase in value of \$574, after deducting costs of shearing and burning. The labor charge, covering the time of one shearman, one helper and one burner, plus the cost of oxygen and acetylene used, amounted to \$172. This practice represents an average monthly profit at this point under normal conditions. Figures covering the calendar year 1930 also show a profit of \$1,026 at Cincinnati as the result of this operation. At that station, Class 17, uncut structural and bridge steel, represented the bulk of scrap which was converted into Class 24, heavy melting steel.

The preparation of scrap, where cutting and shearing are necessary, is limited, however, to those few special classes of scrap where much better prices can be obtained thereby, and to scrap required in our rolling mill and forge shops. Most of the scrap work is purely a sorting operation.

Preparation of Scrap for Shops

While most of the scrap is sold, the Baltimore & Ohio utilizes every pound that it possibly can in its own manufacturing shops and foundries. All scrap brass is shipped to the Mount Clare shops at Baltimore for use in the brass foundry, the accumulation at each station

being loaded in skid-pans and shipped to Mount Clare in material express cars. A separation is made by the forwarding storekeeper between brass borings, journal bearings, engine brasses and miscellaneous brass, thereby eliminating the necessity of sorting it at Mount Clare. Practically all the brass received at Mount Clare is used in the foundry, that which is sold consisting of articles containing a percentage of other metals that cannot be separated economically. This is reported as brass with a small percentage of iron, etc.

Cast-iron scrap, Classes 8, 9, 10 and 11, is segregated at all shops on the system and stations on the Western lines ship it to Newark, Ohio, while the Eastern lines ship it to Mount Clare, the Newark Foundry consuming approximately 400 tons and Mount Clare 150 tons of cast-iron scrap each month. The Newark foundry operates almost exclusively on scrap metal, whereas Mount Clare uses considerable pig iron in addition.

At Cumberland, Md., the road has a rolling mill and a large bolt and forge shop which operates extensively on scrap furnished from the system. In order to facilitate handling at Cumberland, all storekeepers separate the scrap shipped there into eight grades and are governed by printed instructions issued jointly by the chief of motive power and equipment and the general storekeeper. The different grades are as follows:

Grade A—All wrought iron and soft steel arch bars, tie bars, coupler yokes, brake levers, truck spring stirrups, body and truck transoms.

Grade B—All car and tender axles, all sizes.

Grade C—All wrought iron, mild or soft steel scrap, such as carriage, square, and hex head machine bolts, rivets, rivet heads, lag screws, nuts, washers, drift bolts, fin head bolts, chain and material of a similar nature, and small forgings free from attachments (forging butts, high carbon steel, galvanized iron or steel, or case-hardened steel not to be included). Stations that do not have shears for cutting to length should include pieces that are over 32 in. long in Grade H.

Grade D—All plate and bar shearings not over 5 in. in width and 32 in. in length.

Grade E—All staybolts.

Grade F—Wrought iron and soft steel pipe, flues and superheater tubes. Such stations as can do so must rattle the flues, clean the pipe, flatten and cut to 32-in. lengths. Stations not prepared to flatten and cut to length will ship as collected, separating the flues from the pipe and stripping the pipe of all fittings (galvanized pipe, electrical conduit, either plain or galvanized, superheater units, and Sterling boiler tubes are not to be included).

Grade G—All uncut bridge scrap other than girders and heavy I-beam type of cross-brace sections.

Grade H—All wrought iron and mild or soft steel rods, free from attachments, such as tie rods, brace rods, truss rods, brake shafts, door winding shafts, etc.

So far as possible, only one grade of scrap will be loaded in a car. At stations which cannot accumulate carload lots, two or more grades may be loaded in one car, provided the loading is separated to prevent mixing.

In loading Grades F and H scrap with a crane, timbers should be placed between the sling loads and sides of the car to facilitate chaining up when unloading.

How Scrap Is Accounted For

Those classes of scrap that are not consumed by the company are reported for sale in advance by the storekeeper. At a specified time each month, the storekeeper compiles a statement on a printed form which shows the various classes of scrap, fully described. The storekeeper endeavors to anticipate the quantities of each class that will be available for sale during the next 30 days.

This report is then sent to the general storekeeper for checking and it is then forwarded to the purchasing agent. These reports are then consolidated and a printed circular is prepared and sent to various scrap dealers inviting bids. The scrap is sold to the highest bidder f.o.b. Baltimore & Ohio tracks. These circulars report the total available scrap for sale, regardless of its location. A certificate of sale, in duplicate, is then given to the general storekeeper. The latter keeps a master record, showing exactly where the scrap is located, who holds sales certificates and what shipments have been made and when, including car numbers.

The duplicate certificate is sent to the storekeeper who is to ship the scrap and is held by him until the shipment is completed or cancelled. This certificate

shows the name and address of the consignees, the f.o.b. point, terms of sale, the price and expiration date, in addition to the quantity of scrap sold, by classes.

For the purpose of establishing a value for the scrap carried in the stores department accounts, price lists are issued by the purchasing agent from time to time. These prices are based on the value of the various grades of scrap in the open market and are used by the stores department when allowing credit for scrap received or when billing other departments for scrap used by them. It is also the basis for computing the profits or losses resulting when scrap is sold.

When the storekeeper makes a shipment, the tonnage is checked off on the certificate and the collection bill is made. An original and several copies of this bill are sent to the general storekeeper who compares them with his master record and checks the price, class of scrap, etc., after which the original is forwarded to the assistant comptroller for collection and a copy to the purchasing agent for his record. On the copy of the collection bill kept by the general storekeeper, he inserts the amount of profit or loss, which represents the difference between the stock and selling prices.

How Departments Get Their Credits

The profits and losses are compiled by the general storekeeper and totalled at the end of each month's business, at which time they are passed on to the department that originated the scrap. Before this is done, however, the storekeeper sends in a statement showing the cost of handling for the month. This includes all labor, freight charges paid on off-line shipments (all scrap is handled on the company's lines dead-head) and the amount of claims allowed for shortages in weights, etc. A separation is made by the general storekeeper between the profits and losses accruing to the various departments which furnished the scrap. After deducting the labor, freight and claims from the profits, the differences between the total profits and losses are passed on to the other departments as a debit or credit, as the case may be.

Both the motive power and maintenance of way departments pro-rate the profits or losses over all the divisions, the percentages used being based on the amount of new material issued during the previous six months. Again, the exception is rail. The profit or loss is given to the division which furnished the scrap.

All of the scrap furnished to the shops and foundries is charged to the motive power department at the regular stock price in effect at the time.

Salvage and Repair at Source

There are no large store department reclamation plants on the Baltimore & Ohio such as are operated on many large systems because material that can be reclaimed is seldom allowed to reach the scrap pile. When a locomotive is dismantled for classified repairs, each part is carefully inspected when removed. If the part can be re-used, it is sent to the shop and repaired. If unfit for further use, it is thrown into the scrap car. This is also the practice at car-repair shops. Parts that can be used over again are seldom sent to the scrap yard, but are reclaimed immediately by the mechanical department.

The effect of this practice is to save rehandling costs. However, it is not intended to create the impression that the effort is not made to reclaim every piece of material or equipment that can be re-used; on the contrary, nothing that can be used is discarded. The reclaiming or repairing, however, is carried on by the mechanical department in its larger shops.

Scrap brake beams from the entire system are shipped to Cumberland where all usable parts are salvaged and the beams rebuilt. Scrap elliptic locomotive and car springs are shipped to Mount Clare and Glenwood to be rebuilt in the spring plants at these shops. Grain-door reclamation plants are operated at Baltimore, Md., and Chillicothe, Ohio, and Fairport, where all grain doors are rebuilt and edges squared. These plants also reclaim lumber, automobile blockings and bracings.

Rail saws are operated at Willard, Ohio, and Martinsburg, W. Va., where suitable scrap rails are sent to have holes plugged, ends sawed and re-drilled. This rail is then re-used. A maintenance of way shop at Martinsburg repairs frogs, switches, guard rails, etc., and also rebuilds baggage and warehouse trucks, platform scales and other miscellaneous items. Scrap air, signal and steam hose are shipped to Pittsburgh where the fittings are removed and placed on new hose, supplying the system.

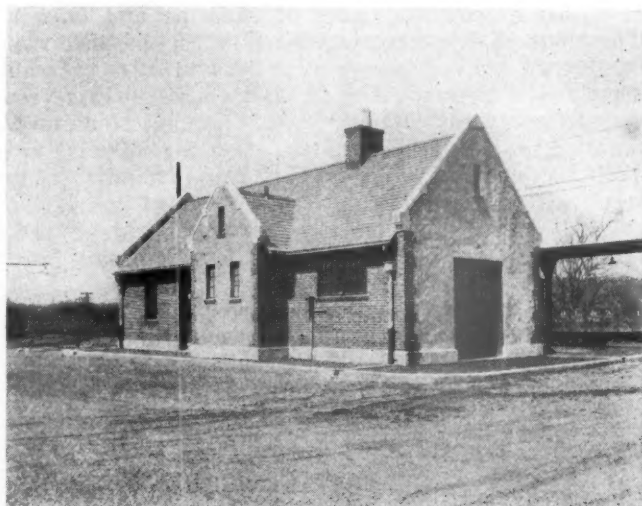
These are but a few of the items reclaimed at the various shops. The policy is to have each shop handle the reclamation of a limited number of items, rather than have a large reclamation plant involving a heavy investment in machinery.

Low Cost of Handling

From what has been set forth here, it can be seen that every piece of old material removed from equipment, roadway, etc., is accounted for and credit given with a minimum of accounting and without the necessity of keeping elaborate records. The saving made by the operating department is reflected in lowered costs of maintenance. The average monthly scrap credit given to the operating department during 1930 amounted to more than \$258,700.

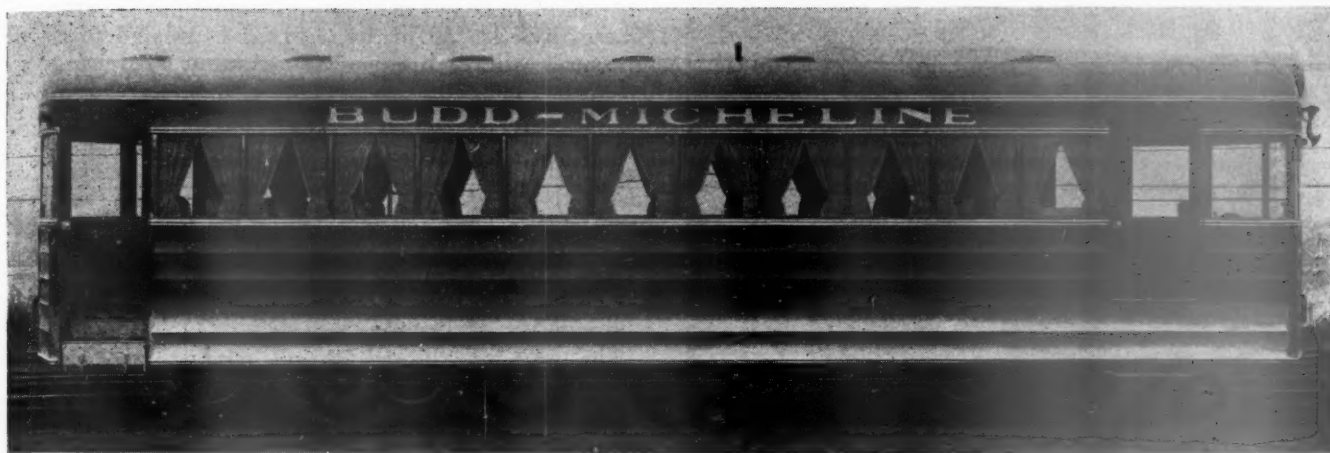
The average cost of handling scrap at the scrap yards in 1929 was 49 cents per ton, this figure including labor and yard supervision, fuel, power and water for cranes, etc., for handling the scrap from the time it is received in cars at the yards until it is finally shipped, this cost being determined on the basis of the number of tons of assorted scrap shipped from the yard either to scrap dealers or for subsequent use by the railroad.

* * *



Courtesy D. L. & W. R. R.

Delaware, Lackawanna & Western Station at Lyons, N. J. Construction of this, the only new station built by the Lackawanna during 1931, was made necessary to provide adequate accommodations for passengers traveling to and from the new United States Government Veterans' Hospital at Lyons, as reported in the *Railway Age* of December 20, 1930.



The Budd-Micheline Rubber-Tired Rail Car

Rail Car Runs on Pneumatic Tires

Budd-Micheline development is a stainless steel structure which weighs less than seven tons and carries 40 passengers

IN 1929 the Michelin Company, automobile tire manufacturers in France, began experiments for the purpose of adapting pneumatic tires to a light type of motor car for operation on rails. In France, as elsewhere in Europe and America, the continued maintenance of steam passenger service on many branch lines has become unprofitable and much of the passenger business has left the rails for the highways. The Michelin development was undertaken in the belief that if a vehicle sufficiently light to be carried on pneumatic tires could be developed which would operate on rails, the character of the rail service which could be rendered would offer sufficiently greater attractions, both as to appointments and smooth riding qualities of the vehicles themselves and as to the convenience of schedules, to bring a profitable amount of traffic back to the railroads.

As a result of these experiments a pneumatic tire of suitable profile mounted on a disc wheel, the rim of which includes the necessary metal flange, was developed and applied to nine successive types of rail motor cars, the last of which is designed to seat 24 passengers, with an unloaded weight of 9,630 lb. It is designed for a useful load of 4,760 lb., including passengers and hand luggage, and is carried on five axles, three in the front or power truck and two in the rear idler truck. To avoid interference of the flange with rail-joint fastenings in case of sudden deflation of the tires a rigid ring of wood or Bakelite is attached to the rim of the wheel, projecting into the inner-tube space within the tire casing so that the drop of the wheel in case of deflation does not exceed $\frac{3}{8}$ in. The tire, which is necessarily limited to small diameter by the width of the head of the rail, is inflated to a pressure of 85 lb. per sq. in.

This car, in France, demonstrated its ability to operate successfully on standard gage railroad track on 8.5 gal. of gasoline per 100 miles, the high adhesion-factor of the pneumatic tires (about three times that of steel tires on rails) permitting rapid acceleration and braking deceleration.

Observing the operation of this car in service, officers of the Edward G. Budd Manufacturing Company, Philadelphia, Pa., became interested in the possibilities for light branch-line service in this country where trains in single-car units would meet the requirements, of a combination of rubber tires with a car body in the construction of which the high strength of stainless steel could be utilized to secure light weight.

The Budd-Micheline Rail Car

Unlike the Michelin rail car developed in France, the Budd-Micheline rail car conforms to customary railroad practice in the general arrangement of the car body and its relation to the trucks. The car has a length of 40 ft. 8 $\frac{1}{4}$ in., a width of 8 ft. 9 $\frac{3}{4}$ in., and is 10 ft. 10 $\frac{1}{4}$ in. in overall height above the rail. It has seats for 40 passengers and an unloaded weight of 13,500 lb.—about 340 lb. per passenger seat. It is carried on two six-wheel trucks and is designed for operation in one direction only.

The power truck, was originally designed for electric drive, with the motor supported under the bolster cross-member of the frame with its armature shaft on the longitudinal center line. Shafts equipped with universal joints, one from each end of the motor, extend to the worm-driven differentials on the two outside axles. The details of the drive follow automotive practice.

The truck frame is a riveted structure of low-carbon steel in which no provision for lateral movement has been provided. It is supported on each axle through two pairs of rubber-block springs, each pair of which is set on a yoke suspended from the axle housing. Each rubber spring is made up of four short rubber cylinders, or "doughnuts," acting in series and separated by steel discs.

A reaction or snubbing spring, comprising a single cylindrical block of somewhat more resilient rubber than is used in the load-carrying springs, is inserted below the yoke and held in place by a bottom tie bar extending under all three axles and rigidly



Interior of the Car, Looking Toward the Rear

secured to the truck side frame by bolts which pass down through the centers of the spring sets.

The wheels are of the removable disc type, the tire rim and steel flange being formed integral with the disc. The tires embody an adaptation of the Michelin principle, although they differ considerably in their construction from those developed by Michelin in France. Instead of employing a rigid ring within the casing to limit the amount of collapse in case of deflation, the inner wall of the casing has been thickened under the tread so that under load it is separated from the rim by about 1 in., thus limiting the maximum re-

duction of radius to that amount should the tire collapse. These tires are 30 in. by 3 in. and, inflated to 85 lb. pressure, will each carry a maximum load of about 1,500 lb. They are designed with smooth treads which are approximately flat in section.

Brakes are applied on all wheels. The service brakes are of the hydraulic, internal expanding type and are installed on the wheels of the two outside axles of each truck. They are operated by the Bendix-Westinghouse air brake. A manually operated mechanical emergency or parking brake, also of the internal expanding type, is installed on each of the wheels on the center axles of the two trucks.

The most interesting and unusual feature of the car is the structure of the underframe and body. This structure, together with the outside sheathing, but exclusive of the roof sheets, is built entirely of stainless steel and weighs only about 2,800 lb.

Adapting Stainless Steel to Structural Design

This alloy, which contains 18 per cent chromium and 8 per cent nickel, is well known for its rust resisting qualities which are so complete that the metal retains its bright surface under atmospheric and salt spray exposure indefinitely. Its tensile strength of 180,000 lb. to 200,000 lb. and high elastic limit, which runs to 160,000 lb. per sq. in., combined with satisfac-

Dimensions and Weight Distribution of the Budd-Micheline Rail Car

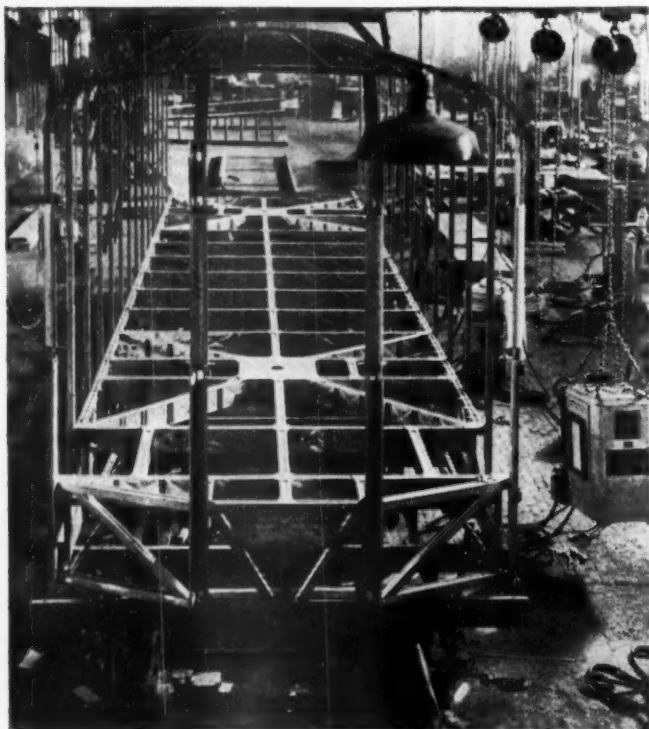
Dimensions:	
Length over body end posts.....	40 ft. 8 1/4 in.
Width, outside.....	8 ft. 9 3/4 in.
Width, inside.....	8 ft. 6 in.
Height above rail.....	10 ft. 10 1/4 in.
Length of passenger compartment.....	26 ft. 8 in.
Length of engine room and baggage compartment.....	9 ft. 7 in.
Truck wheel base.....	6 ft. 4 in.
Distance between truck centers.....	24 ft. 0 in.
Tires.....	30 in. by 3 in.
Seating capacity.....	40
Baggage capacity.....	1,500 lb.
Weights:	
Body.....	6,341 lb.
Motive power.....	1,600 lb.
Power truck.....	2,879 lb.
Idler truck.....	1,931 lb.
Miscellaneous parts.....	797 lb.
Total.....	13,548 lb.

tory ductility and freedom from corrosion, suggest the possibility of adapting it to structural use in thin sections as a means of reducing weight.

The difficulty, however, was in finding a satisfactory means of joining sheets only a few thousandths of an inch in thickness. The use of rivets soft enough to work is impracticable because of the lack of sufficient bearing area. Ordinary welding processes were unsatisfactory because the heat treatment of the metal surrounding the welds changed its molecular structure, destroying both its rust-resisting characteristics and its strength. The Budd Company has developed and patented a spot welding process which has overcome this difficulty. This process, known as the Budd "Shot-Weld" system, in principle, controls the time within which the weld is made within limits which do not permit the sheets to be heated by conduction to a temperature above the critical point. The range of time within which the process is applied varies from a maximum of a hundredth of a second to a minimum of a thousandth of a second and is short enough to prevent a change in the molecular structure of the metal even through a section of the weld itself.

The Body Structure

The entire frame of the car is built up of special structural sections, the material in which is .030 in. in thickness. These members are formed by cold pressing and spot welding by the Budd process, each being essen-



The Stainless Steel Frame During Construction

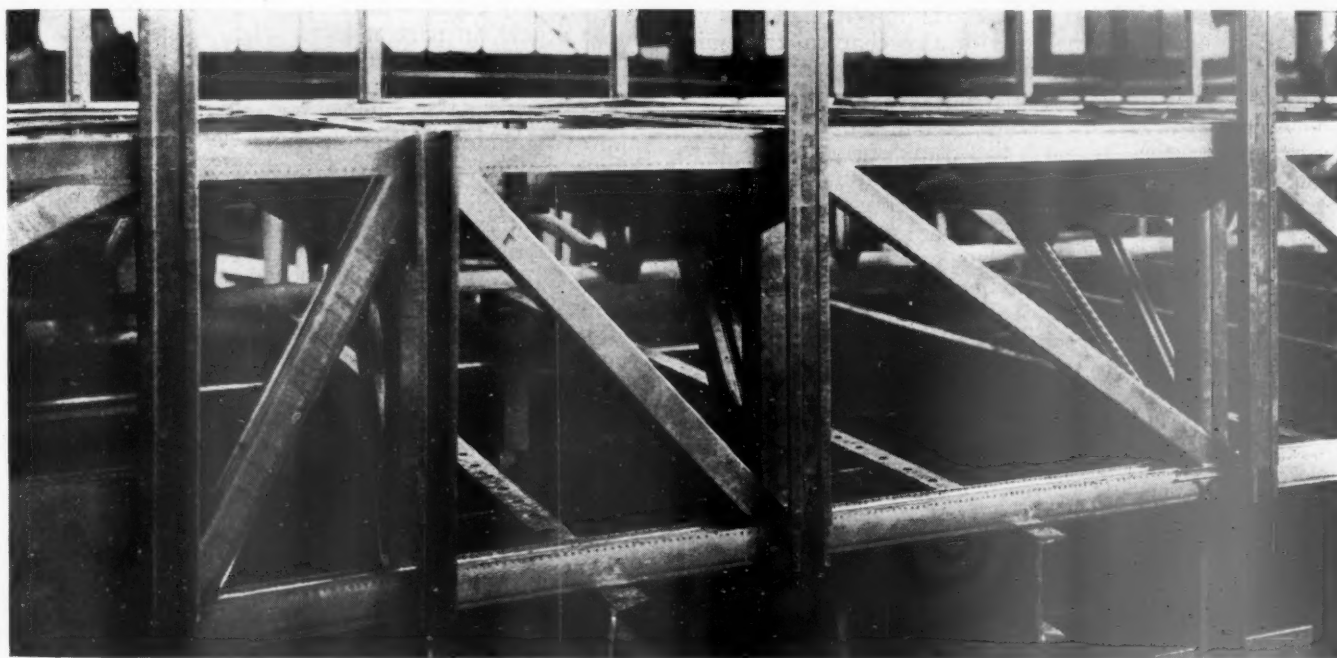
tially of full box section with the flat surfaces of the thin metal stiffened against buckling under compression loads by corrugations.

The main load-carrying members are built in the form of Pratt trusses, 23 in. deep, which form the side members of the underframe. The tops of these trusses are at the floor level. The crossties are also built up of top and bottom chords and verticals. In this case, however, the diagonals are replaced by .009-in. sheets corrugated diagonally to overcome the tendency of the thin sheets to rattle. Transverse diagonals extend from the bottom chord of the side trusses to the bottom of the transverse members.

The design of the car-body frame utilizes essentially the same elements as are common in conventional steel passenger-car design. It consists of side posts and carlines which are telescoped and welded together to form single continuous units from side sill to side sill, with longitudinal members at the window ledge and at the top and bottom of the letter board, together with several longitudinal spacers or purlines set in between

The interior of the car body below the windows and the ceilings, extending down to the tops of the windows, are finished with Micarta panels backed with a sponge-rubber insulation. The windows, which are of non-shatterable glass, are set permanently in place with no provision for opening and are dust tight. Positive pressure ventilation is provided, fresh air being brought in through the sides of the car near the front end and delivered through ducts which extend along the sides under the seats. The air drawn into the car passes through compact tubular heaters, one of which is placed under the window at each side of the car at the rear of the engineroom and baggage compartment. Heat is supplied by Pyrofax gas, the hot products of combustion passing up through the tubes of the heater which are surrounded by the air as it passed toward the ducts through which it is delivered to the interior of the car. Ducts with outlets through the roof carry the products of combustion outside the car. For cooling in summer the use of Dry Ice in the heaters is contemplated.

To provide for wiring, lighting and ventilators, a duct



A Portion of the Truss Side Frame—The Welds in the Built-Up Members May Be Clearly Seen

the carlines. The body posts extend down outside the side trusses of the underframe for their full depth and are attached to both the top and bottom chords.

The outside sheets are made up in pressed concave units of .009-in. metal. These pressed units are welded together at their internally projecting flanges and are welded to clips at each side post, the arrangement being such as to permit the sheets to adjust themselves to the deflection of the frame structure without noticeable warping or weaving of the exterior surface. They perform no load-carrying function.

The roof sheets of this car are of aluminum alloy and are attached to the frame members with rivets. These are practically the only rivets used in the car-body structure.

The base of the car floor is of plywood, over which has been applied a cork surface. Methods of forming thin sheets of stainless steel to serve as a light, stiff floor base are being developed at the present time, but were not sufficiently well along to be incorporated in this car at the time it was built.

dropped below the ceiling extends throughout the length of the passenger compartment of the car. Grille openings in the sides of this duct lead to suction ventilators through the center line of the roof. Some of which are equipped with electric fans and the others of which are of the suction-ejector type.

Lighting

The interior of the car is lighted by thirty 21-candle-power, 6-volt automobile headlight lamps connected in groups of five in series. Two of these lights are mounted over the rear platform and the remaining 28 are placed at regular intervals in parabolic reflectors set flush in the sides of the overhead ventilating duct. The light is projected horizontally and strikes the curved surface of the ceiling from which it is diffused and reflected downward. The effect is pleasing and novel. Illumination on the reading plane is $1\frac{1}{2}$ foot-candles. Power for lighting is supplied by a 150-watt, 32-volt generator driven from the engine crank shaft by a double V-belt and operating in conjunction with a

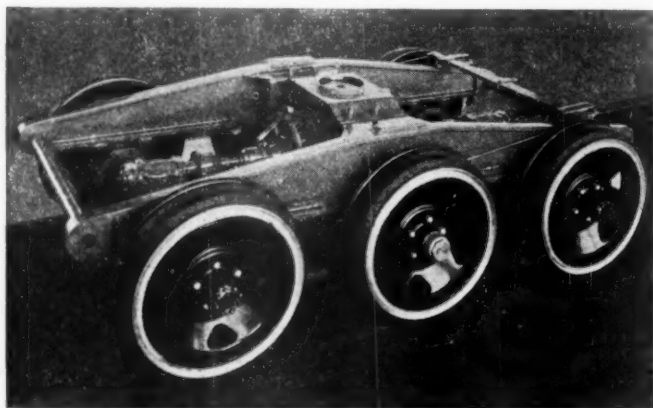
300-amp.-hr. airplane type storage battery. The same power plant also supplies markers and a standard 250-watt headlight.

The seats, designed by the builders of the car, are of the double bucket type and are non reversible. Each double seat complete with cushions weighs about 34 lb. The frame is of steel tubing and the cushions are filled with rubberized hair.

The Power Plant

When the car was built a Diesel-electric power plant was installed. The engine and generator set were placed transversely at the front end of the car utilizing the space enclosed by the frame trusses below the car floor to equalize the weight, the power truck was placed at the rear end of the car. The engine was a three-cylinder, two-cycle Junkers type, designed by the Budd Company engineers to develop 90 hp. This power plant was considered sufficient to develop speeds of 45 miles an hour. The use of electric transmission with a power plant of such small capacity, however, involved a considerable amount of unnecessary weight and transmission loss and the Diesel-electric power plant was removed to equip the engine with a mechanical transmission. While this work was under way a gasoline engine and gear-shift transmission was removed from a Chrysler Imperial model automobile and installed in the engineroom of the car, with the crank shaft in line with the longitudinal center line. The output end of the transmission and the drive shaft connecting the two power axles of the front truck were equipped for chain drive. This engine, which develops considerably more power than the Diesel with less transmission loss, has driven the car at speeds of over 60 miles an hour and, on relatively level track, has demonstrated its ability quickly to accelerate the car with full load to speeds of over 50 miles an hour.

This car has made a number of demonstration runs over the Reading freight line from Nicetown (Philadelphia) to Bridgeport, Pa. Its operation is remark-



The Rubber-Tired Power Truck Equipped for Electric Drive

able for the absence of noise and vibration and for the smoothness with which it moves around curves at high speed. It rides smoothly through switches and cross-overs and there is little evidence of more than occasional flange contact with the rail. Because of the high factor of adhesion it is said that the car can be stopped from 60 miles an hour in 400 ft.

To provide for the operation of signals two pairs of spring-loaded contact shoes in sliding contact with the rail, one pair at each end of the car, have been installed. The shoes in each pair are cross-connected with an electrical conductor.

I. C. C. Approves Loans to Railroads

WASHINGTON, D. C.

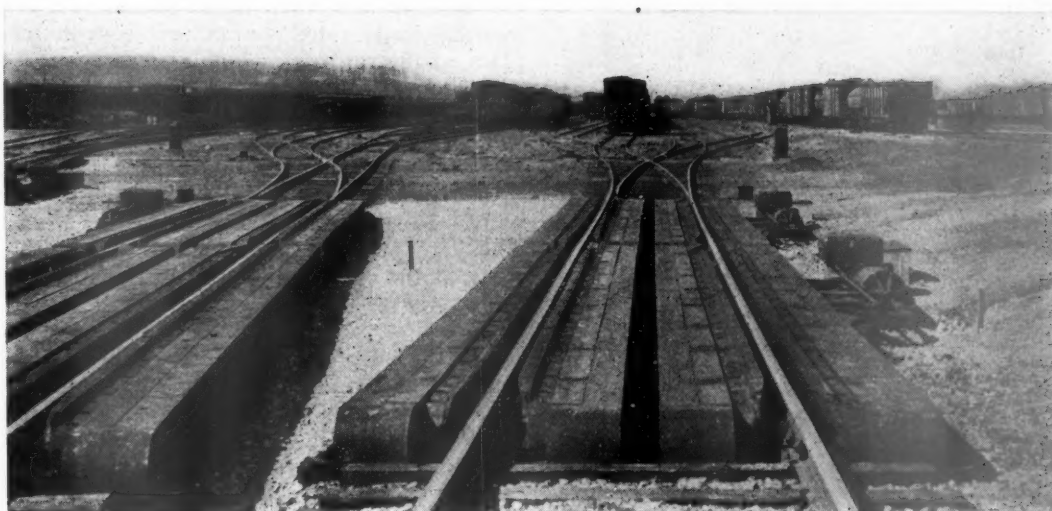
THIRTY railroads had applied to the Reconstruction Finance Corporation up to March 2 for loans to the amount of approximately \$228,000,000 and the Interstate Commerce Commission by that date had reported its approval of loans to 13 railroads, amounting to \$53,000,000, usually for only a part of the amount asked to meet the more pressing requirements, but without prejudice to approval of additional loans upon further information and investigation. Up to that date, however, the Finance Corporation had announced its approval of loans only in five instances, stating that they were made at 6 per cent interest and were granted without prejudice to the consideration of additional loans already applied for or which might be applied for hereafter. Loans are made for one, two or three years, but in many cases it is the understanding that they are to be repaid, in part at least, when loans are available from the Railroad Credit Corporation.

The Interstate Commerce Commission has adopted a policy of making public its reports, by Division 4, approving loan applications, and on February 29 also began making public brief memoranda of the applications filed which had not yet been acted upon, giving the amount requested, the purpose of the loan and the security offered. Twelve such applications were made public on that day. The approval reports were dated on various dates from February 10 to February 29.

The commission had previously announced its approval of a loan of \$7,173,800 to the Wabash receivers, on an application for \$18,500,000, and of a loan to the Missouri Pacific of \$1,500,000 to meet interest due February 1, on an application for \$23,250,000. On February 19 the commission approved a further loan of \$2,800,000 to this company to meet interest due March 1. The later approvals were: St. Louis-San Francisco, \$2,805,175, on an application for \$17,998,542; Erie, \$4,458,000 on an application for \$10,350,000; Alabama, Tennessee & Northern, \$275,000; New York, Chicago & St. Louis, \$9,300,000, on an application for \$33,000,000; Chicago & Eastern Illinois, \$3,629,500, on an application for \$7,196,436; Minneapolis, St. Paul & Sault Ste. Marie, \$2,300,000 on an application for \$15,329,608; Chicago & Northwestern, \$7,600,000 on an application for \$26,000,000; Southern, \$7,500,000, on an application for \$10,000,000; Mobile & Ohio, \$785,000; Central of Georgia, \$1,418,700, on an application for \$2,583,322; Western Pacific, \$2,102,000. The loans announced by the Finance Corporation as having been approved are those to the Wabash, the Southern, the Alabama, Tennessee & Northern, the Chicago & Eastern Illinois, and the Western Pacific.

Many of the loans approved are in anticipation of loans to be made by the Railroad Credit Corporation to meet interest requirements, but as that corporation will not receive funds from the temporary emergency freight rate increase until about the middle of the month an arrangement has been made by which the Reconstruction Finance Corporation has advised the commission that it is prepared to make advances to railroads pending receipt of funds for the purpose from the Railroad Credit Corporation. By a resolution adopted February 17 the railroad corporation approved immediate advances to a number of roads, to be made when its

(Continued on page 410)



The Tracks Are Arranged in Groups of Six Each

Retarders in Potomac Yard Facilitate Movement of Perishables

Average operating cost reduced 10.69 cents per car
classified—New type control machine used

IN February, 1930, the Richmond, Fredericksburg & Potomac placed in service an installation of car retarders in the northbound unit of its Potomac yard at Alexandria, Va. Since then, this yard has experienced its usual seasonal peaks of traffic so that comparisons can now be made between the present method of operation and the former car-rider method. From these studies it is found that, even on the basis of the reduced traffic handled since the retarders were placed in service, the retarder operation has resulted in savings of approximately 10.69 cents per car classified.

Potomac yard is one of the main freight gateways between the North and South. Northbound traffic is delivered to it by five railroads—the Southern, the Chesapeake & Ohio, and the Richmond, Fredericksburg & Potomac itself, with Seaboard Air Line and the Atlantic Coast Line business also moving from Richmond over the R. F. & P. This traffic continues northward over the Pennsylvania and the Baltimore & Ohio. A large proportion of the traffic through Potomac yard, particularly in the busy seasons, consists of perishables from the South, including citrus fruits and vegetables. Such traffic, of course, requires unusually expeditious and careful handling in order to meet scheduled deliveries at New York, Philadelphia and other northern cities, without deterioration or damage. The car-retarder operation has not only resulted in the faster movement of these perishables but has greatly speeded up the handling of the remaining traffic of merchandise and coal.

The Yard Layout

The northbound yard formerly consisted of 38 classification and 8 hold tracks, arranged on the multiple

ladder principle, with power switches controlled from a push-button machine in the yard-master's office. At the time of the installation of retarders, the tracks were rearranged into groups of six and a few of the tracks were extended, the finished yard having 46 classification and hold tracks.

A considerable proportion of the perishables arriving at this yard are billed to this point for reconsignment. This necessitates a considerable number of "hold" tracks and the constant reclassification of the cars on those tracks as definite consignment orders are received. The outer group of tracks at the east side of the yard was, therefore, selected for these hold tracks. A connection was then installed, leading from this group only, which enables refrigerator cars on any of the tracks in this group to be pulled back around the hump to the icing station. The height of the hump was not changed materially but the gradients were rearranged in order to provide satisfactory retarder operation. An unusual feature of this layout is the fact that there are two tracks over the hump, without a "scissors" crossover. One of these tracks is equipped with a new plate-fulcrum scale, the other being used for humping trains that do not include any "weigh" cars.

The direct-acting switch machines previously in service were utilized in connection with the present installation and enough new machines of this type were provided to equip the additional tracks, together with 27 retarders and 46 power-operated skates, all controlled from two towers, one of which contains two control machines. These machines are of a new type in that the slope of the top plate is reduced, bringing the back of the machine lower and thereby enabling the operator to see tracks close to the base of the tower, whether



The Control Machines Are of a New Type

he is sitting or standing at the machine. In addition, the top plate of this new machine is of the unit-panel type, so arranged that any one panel may be raised without disturbing the others on the board and even without interfering with the operation of the units controlled from the raised panel; all of this tends to facilitate inspection and maintenance. The towers in which these machines are housed were designed and built by the railroad; they are commodious and provide a practically unobstructed view. Furthermore, they are steam heated from a central plant.

Teletypes and loud speakers are provided in each of the operating towers and in the yard master's office.

Compressed air for the operation of the retarders, switches and skates is obtained from the central power plant of the railroad, which also serves the enginehouse and shop at that point. The control battery that was formerly used for the control of the switch machines, is now employed also for the control of the retarders and skates. The apparatus for this installation was furnished and installed by the Union Switch & Signal Company. Kerite bronze-taped cable was used throughout. The yard presents a neat appearance with no obstructions, as the air line and cables are underground.

Economics

For the purpose of comparing the operating costs of retarder and rider operations, three-months periods in 1928 and in 1929 were contrasted with similar months of 1930 and 1931. Under rider operation, an average of 1,467 cars were handled daily, of which approxi-

Cars Handled Over North Hump—Potomac Yard, Va., with Car Riders

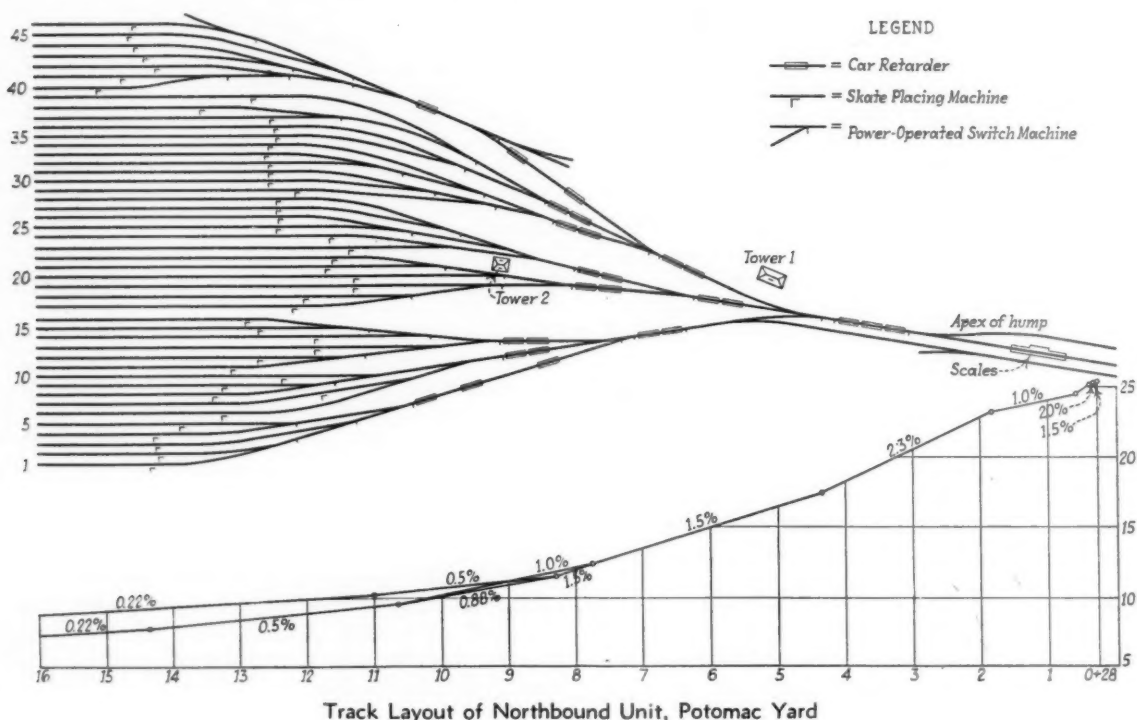
Period	Total Cars Handled	Perishable Handled	Transportation Cost of Handling	Transportation Cost per Car
1928				
October	37,819	4,757	\$14,921.80	39.45 cents
November	41,328	6,629	15,584.90	37.70 cents
December	37,216	6,399	15,192.05	40.82 cents
1929				
May	56,689	16,252	19,565.25	34.51 cents
June	52,428	16,518	18,871.65	35.99 cents
July	44,508	9,940	17,139.85	38.50 cents
Total	269,988	60,495 or 22.4%	\$101,275.50	37.51 cents

Cars Handled Over North Hump—Potomac Yard, Va., with Car Retarders

1930				
October	34,920	4,229	\$9,019.80	25.83 cents
November	35,899	7,362	10,711.75	29.84 cents
December	33,218	7,493	10,736.00	32.32 cents
1931				
May	49,597	17,845	10,909.70	21.99 cents
June	43,637	15,801	11,190.95	25.62 cents
July	43,058	14,122	11,890.05	27.61 cents
Total	240,329	66,852 or 27.8%	\$64,458.25	26.82 cents

mately 22.4 per cent carried perishables, while under retarder operation, these figures were respectively 1,306 and 27.8. The numbers of cars handled per month in each of the periods selected is shown in the table.

The total transportation costs of handling this business for the periods shown above were \$101,275.50 and



\$64,458.25, which, reduced to an annual basis, represent a saving of \$73,634.50, in favor of the retarder method of operation. This, reduced to a car basis, is 10.69 cents per car. In addition, the ability to receive and classify cars when and as offered, as well as the reduced damage to lading and equipment, are also of real value although not easily expressed in dollars and cents.

Nalco Continuous Blow-Down System

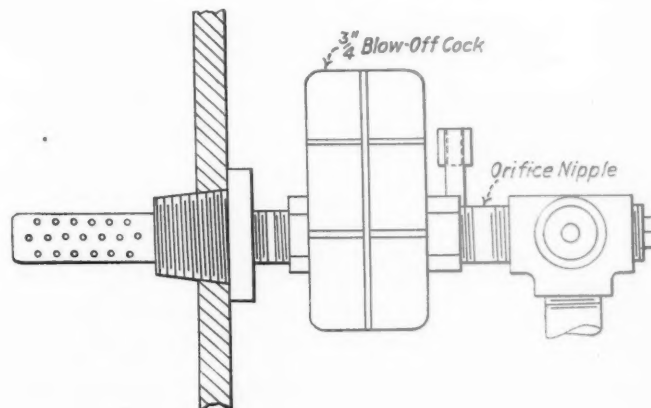
WITH a view to promoting improved locomotive boiler operating conditions, the National Aluminate Corporation, 6216 West Sixty-sixth Place, Chicago, has developed the Nalco continuous blow-down system, now being extensively tested in service applications on over 200 locomotives. The use of this system, together with proper water treatment, is designed to enable locomotives to be kept in service during 30-day periods, without intermediate boiler wash-outs between those necessary to meet the federal requirements. This will result in substantial savings of locomotive lay-over time at engine terminals, as well as the expense incident to frequent water changes and washing out of boilers.

The general arrangement of the Nalco Continuous Blow-down System is illustrated. It comprises essentially a boiler connection assembly, blow-off cock, and suitable operating valves, which deliver blow-down water, steam and sludge at a continuous low rate of discharge either to a heat-recovery coil in the tender tank, or to a centrifugal blow-down separator, located on top of the boiler just ahead of the cab. From the latter point, flash steam escapes to the atmosphere where it does not obstruct the view of the engineman and water is discharged to the roadbed.

The important advantage of the Nalco System is its design to afford maximum heat recovery from the blow-down water. This is accomplished by the provision for passing the water through flexible hose connections to the tender tank coil rather than through the centrifugal separator. However, during warm weather, or in cases where the tender water is heated by steam from other auxiliaries, the centrifugal separator is used to prevent overheating of the tender-tank water, which would interfere with the injector. It is claimed for this type of continuous blow-down that a minimum total blow-off is required to keep the boiler water concentration

at a given amount, and that it provides a most efficient means of removing suspended solids as well as dissolved solids in the boiler water.

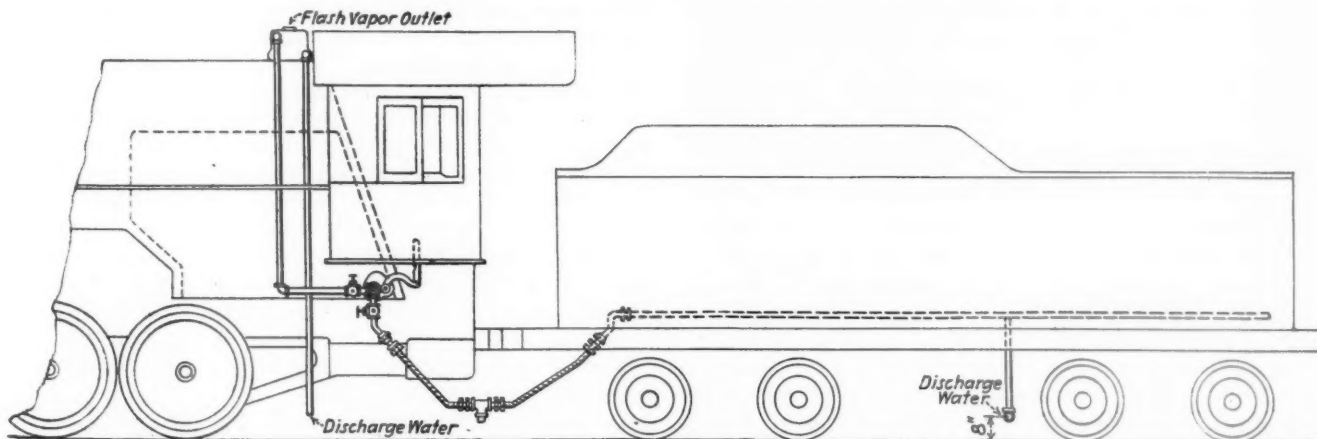
Referring to the drawing showing the boiler-connection assembly of the Nalco System, the water first



Details of the Nalco Boiler Connection Assembly

passes through a perforated nipple extending through the boiler plate, thence through the blow-off cock, and orifice proportioned to give a rate of discharge which will keep the boiler water within the desired limits of concentration. From this point, the water may be passed either to the tender coil, where practically all of the heat is recovered before the water is discharged to the road bed, or it may go to the centrifugal blow-down separator. Connection between the engine and the coil in the tender tank is made by means of a $\frac{3}{4}$ -in. by $1\frac{1}{2}$ -in. steam hose, equipped with an automatic drain valve which closes when blowing down through the tender coil. When the blow-off valve is closed, however, this drain valve automatically opens and permits water in the hose and connections to drain to the road bed, thus avoiding freezing. The tender-tank coil consists of $\frac{1}{2}$ in. pipe: 60 to 100 ft., depending on the size of the orifice used.

THE DELAWARE, LACKAWANNA & WESTERN, effective Monday, February 15, placed coffee and crullers on sale at popular prices on the upper decks of all railroad ferry boats operated in connection with its trains between its rail terminal at Hoboken, N. J., and its ferry terminal at Barclay street, Manhattan. This service, which has been inaugurated for the convenience of patrons, will be in effect daily between 7 and 9.30 a. m., and is in addition to the regular restaurant facilities operated by the Lackawanna in its Hoboken station.



General Arrangement of Nalco Continuous Blow-Down System, Including Tender Heating Coil and Centrifugal Separator

Railway Regulation Adrift*

Misguided zeal has extended I. C. C. activities far beyond the few simple matters in which the public has an interest

By Alexander H. Elder

General Solicitor, Central of New Jersey

REGULATION has become so trite a topic, after months of continuous discussion, that it is difficult to avoid plagiarism. Like Kipling's ballad, which leaves one with a lasting impression that army life begins and ends with "Boots, boots, boots," so the continuous discussion about regulation in the press, in the forum, and on the air, no doubt, leaves many with the impression that transportation itself is not so much a great public service as it is a tiresome subject matter for argument and discussion. Transportation seems no longer primarily a vital end in itself. By acts of Congress and countless state statutes, the railroad industry has become obsessed with a sort of jig-saw puzzle called "regulation" which, in addition to dissipating the time and energy of railroad men, serves as a type of unemployment relief for a growing army of commissioners, examiners, transportation experts, analysts, advisors, consultants and other specialists. This diversion of attention from the pressing problems of transportation itself to regulation, with its accompanying tendency to strip management of initiative and to encourage benevolent meddling by theorists, has submerged the transportation industry in a maze of idle technicalities.

In approaching the inquiry as to what regulation should be applied to the new competitors of the railroads, the question at once arises,—Should present railroad regulation be adopted as a pattern or as a deterrent? To find the answer, it is necessary to reflect briefly on our 45 years of experience with railroad regulation. What were its main objectives originally? Have they been attained? Whither is regulation drifting?

The original purposes of railroad regulation were very simple. By 1887, when the original commerce act was adopted, a gigantic system of railroads reaching to every corner of the national domain had been constructed by private capital. This transportation machine was, far and away, the most efficient system of transportation the world had ever seen. Both mechanically and financially it was a magnificent product of private enterprise and initiative. At that time, however, the railroads in a measure enjoyed a monopoly, and since they were performing an essential public service, the public asserted, and the courts sustained, the public right to demand (1) that railroad rates should be reasonable and (2) that railroad service as well as rates should be non-discriminatory. It was solely to enforce these rights that our present national policy of regulation was adopted.

Simplified Regulation Required

While the statute still retains an obsolete legal presumption that any rates increased since 1910 are unreasonable, it may safely be premised that, in view of 45 years of continuous rate regulation, and in view also

of the present admitted inadequacy of railroad revenue, the presumption of fact is that railroad rates today, both individually and collectively, are not more than reasonable, to say the least, and that, if regulation has done anything to justify itself, discriminatory practices have, in the main, been eliminated. The original restrictive purposes of railroad regulation have therefore been accomplished. In the meantime, two fundamental changes have occurred,—First, railroad regulation has drifted far from its original moorings, and second, the rapid development of publicly financed highways and waterways has destroyed whatever monopoly of transportation the railroads originally enjoyed. Thus time and change have sawed off the limb on which railroad regulation was originally perched and today, the public interest requires that the whole system of railroad regulation be radically simplified.

A very brief enumeration of certain respects in which present-day regulation seems obsolete will suffice. These observations, it should be stated, do not imply any reflection on the intelligence or integrity of our regulatory officers. The defects to be mentioned are due partly to laws which the commissioners are sworn to enforce, and partly to recent revolutionary changes in transportation produced by the building of highways and the development of automotive transportation. The very fact that regulatory officers have wrestled with their problems and failed so lamentably notwithstanding their industry and good intentions, is the best evidence that there is something fundamentally wrong with the whole system of railroad regulation. Only a few of the anomalies in the present system are listed below:

Anomalies in Present System

1. Our whole railroad rate regulating plan was designed to protect the public from the abuses of monopoly but today it seems obvious that no railroad monopoly exists anywhere.
2. The provisions of the Transportation Act governing extensions of operation were designed to prevent wasteful duplication of facilities by private capital, but while the federal government has been enforcing this paternalistic doctrine, the 48 states, with a fine regard for laissez-faire principles, have been duplicating at public expense, and almost without restriction as to use, practically every mile of railroad right-of-way.
3. The abandonment provisions of the Transportation Act and the related provisions in state laws preventing discontinuance of service and facilities, without lengthy hearings and other red tape and delay, discourage the elimination of obsolete transportation facilities, whereas the revolutionary changes now occurring and the lean revenues of the carriers demand that such eliminations be encouraged and hastened.
4. The mileage rate scales which control most of the railroad rate structures today were prescribed on the theory that short haul rates should be higher, mile for

* An address delivered February 18 at the annual conference of the Wharton School, University of Pennsylvania.

mile, than long haul rates, and thus the railroads have been tied in a commission-made harness of high short haul rates and low long haul rates with the result that their revenues from long haul traffic are so inadequate that they cannot afford to meet truck competition on the short hauls where it is most active. In other words, the mileage scales which the I.C.C. has been prescribing for the past ten years, including the Eastern Class Rate Scale which has just gone into effect, are all obsolete today.

5. The valuation provisions of the Commerce Act have occupied much of the time of the Commission since 1913 and have cost the Commission about \$40,000,000 and the railroads about \$138,000,000, making a total of \$178,000,000. While there is a natural reluctance on the part of the Commission to admit publicly that the whole undertaking has been a costly public nuisance, this fact seems reasonably clear since no one can suggest any practical use for the valuation data gathered and a chief problem of the Commission today seems to be what should be done with the several hundred employees still retained in the Commission's valuation work.

6. As to the recapture provisions of the Act, there seems to be a unanimous demand for their immediate retroactive repeal.

7. The obvious need of the railroads is for more traffic, but, by force of circumstances, railroad traffic men in making rates, even today, are often more concerned with the effect a proposed rate reduction may have on the next I.C.C. decision than they are on the immediate effect such a rate reduction might have in increasing railroad traffic and revenue.

8. One of the primary objects of Section 6 of the Commerce Act which requires that all rates be filed and strictly observed, was to secure stability in the rate structure, but while regulation has so "frozen" the rate structure that individual rate changes cannot be secured to meet rapidly changing economic conditions, without intolerable delay, yet shippers for years have been deprived of rate stability by the wholesale prescription of mileage scale rates, including millions of rates about which no complaint has ever been made.

9. If the clear requirements of Section 15a of the Act were observed, it would be necessary to increase rates in times of depression and reduce them in times of prosperity. But this provision of the Act directly conflicts with controlling economic laws and for that reason has never been observed.

10. Rapid developments in the use of containers, detachable truck bodies, and trucks as an incident of rail transportation, calls for prompt and diversified experimentation not merely in physical handling but in rate making and extension of terminal services. At every turn, however, such experimentation is hampered by obsolete tariff regulations and drastic criminal statutes.

11. The Commission for years has urged that Congress relieve it of the duty of awarding reparation in countless rate cases where it is clear that no damage occurred. Yet, the reparation provisions remain in the Act and afford the chief incentive for the filing with the Commission annually of hundreds of complaints, not originating with shippers, but with individuals who make a business of ferreting out technical claims. The result is a tremendous waste of time by the Commission and by railroad officers as well as a dissipation of railroad revenue and a discrimination against the great body of shippers.

12. The provisions of the Act dealing with the issuance of securities were adopted for the professed purpose of protecting investors. It is at least questionable

whether the investor has been benefited by these provisions, but it is clear that the resulting red tape has greatly burdened the Commission and the railroads and it also seems clear, in the light of recent events, that the essential protection which regulation should afford to the investor in railroad securities has been sadly neglected.

Evidence of Misguided Zeal

The above are merely illustrative of the defects in our present system of railroad regulation. The extent to which regulation is currently failing to assure adequacy of railroad revenues is shown by the fact that, notwithstanding an enormous increase in capital investment during the past 35 years, the net income of the Class I railroads in 1931 was the smallest of any year since 1897. The faults of regulation above listed and the resulting poverty of the railroads warrant the conclusion that something is fundamentally wrong with the whole system of railroad regulation. That "something" consists largely in the misguided zeal of both Congress and the Commission to extend regulation from the few simple matters in which the public has a direct interest to almost every detail connected with the construction, operation, maintenance, accounting, management and financing of railroads, whether the public interest is directly involved or not. As examples of this tendency, are the attempts to regulate per diem and divisions contracts between carriers, the wasteful prescription of automatic train control devices, the long-drawn-out and fruitless investigations of locomotive repair and other operating expenditures, and the burdensome and abstruse investigation of depreciation accounting, resulting in an order which, if complied with today, would put every Class I railroad in the "red."

Every such increase in the jurisdiction assumed by the Commission has not merely diverted the Commission's attention from proper regulation but has meant a further intrusion into the field of private management. Every such intrusion means a further curtailment of private initiative and enterprise. It is submitted that the time has arrived to consider seriously a substantial reduction in the field of regulation and a corresponding increase in the freedom of management. To accomplish this, a very brief amendatory bill would be sufficient. Such a bill need merely eliminate numerous frills and furbelows which successive Congresses during the past 25 years have added to the Interstate Commerce Act. Then, in order to make unmistakably clear the complete change of legislative policy which has been adopted, Section 12 of the Act, which in 1889 gave a roving commission to the regulators, should be supplemented by a definite declaration of public policy substantially as follows:

In administering the provisions of this Act, the Commission shall at all times keep in mind that the carriers, subject to its requirements, are privately owned and are operated by managements selected by their stockholders and that the sole function of regulation is to safeguard the public interest, without unnecessarily interfering with private management.

Regulation in an Academic Rut

Such a revision of the Commerce Act would do much to restore a proper equilibrium between regulation and management and that is the vital need in the present transportation situation. However, any regulatory statute must be flexible. Hence, the personnel of our regulatory commissions is of as much importance as the language of the law itself. Our whole transportation system is now subject to regulation, if not quasi-management, by eleven Commissioners, only one of whom has had any railroad experience! If the regula-

tion of transportation is to be taken out of the academic rut in which it now flounders, appointees to the Interstate Commerce Commission must not merely be men of ability and honor, as they unquestionably are, but in addition must have a broad background of practical transportation and business experience.

With the above outline of my views as to regulation generally, it will be clear that, in my opinion, the public should enter upon this new field of regulating competitors of the railroads with a keen appreciation of the dangers and the costs of bureaucracy and a resolve that the new regulation shall be strictly limited to protection of the public interest, broadly construed, and shall not be permitted to intrude into and devitalize private management.

How Control Other Forms of Transport?

As to air transportation, it seems that its importance as a competitive factor is, and will continue for a long time, to be negligible and that the only public regulation of air traffic called for is in respect to safety.

As to the pipe lines, while they have diverted a substantial traffic from the railroads, they afford such an obvious and substantial economy, they constitute such a unique type of transportation facility, and their operation so remotely touches the public interest, that the burden of proving the public necessity of any additional regulation of pipe lines rests upon the proponent and I am not prepared to assume it.

As to highway transportation (and the same is true in a measure of water transportation) the situation is totally different. Examiner Flynn of the I. C. C. admirably summed up the matter in the following words:

The national transportation machine cannot function with progressive efficiency, part regulated, part unregulated; co-ordination of transportation agencies cannot reach its economic position under this anomalous condition. There can be no reversion to the law of the survival of the fittest. The public would not tolerate it and transportation agencies would not welcome it.

In other words, the railroads, on the one hand, and the buses and trucks on the other, occupy the same identical field; they directly compete everywhere for the same traffic. If one remains regulated and the other not, ruthless economic laws will intervene and the transportation machine on which the public is so dependent may be wrecked.

Highway Transport Requires Stabilization

Moreover, leaving the railroads entirely out of consideration, as leaders of the bus and truck industry have recently pointed out, highway transportation requires the stabilizing effect of reasonable rate regulation to offset the excesses of competition, just as the railroads have benefited by the requirement that they file and adhere to their rate tariffs until changed in an orderly way.

In short, the present transportation chaos is due partly to over-regulation of the railroads and partly to inadequate, or in the case of the trucks, almost complete lack of regulation of highway transportation. It would not improve matters to hamstring highway transportation with the same excessive regulation as the railroads labor under.

The sane solution will be to materially reduce present restrictive, burdensome and meddlesome regulation of railroads and to impose on buses and trucks only such reasonable rate, service, safety and insurance requirements as the public interest in safe, adequate and reasonable transportation service justifies. Unquestionably the long delay of Congress and most of the

states in providing for adequate regulation of buses and commercial trucks is seriously undermining railroad efficiency and solvency. With the prompt aid of such rationalized regulation of both the railroad and highway carriers, however, there are countless indications that the national transportation machine is prepared to rebound from this depression with a quality of co-ordinated transportation of which the public does not now dream.

I. C. C. Approves Loans to Railroads

(Continued from page 404)

funds are available, and irrevocable orders have been issued on it for the amounts, to be filed as additional security for loans from the R. F. C., authorizing and directing it to pay the amounts to the R. F. C. for the account of the applicants. The commission's approval reports referred to applications to the railroad corporation amounting to about \$25,000,000.

The loans thus far approved have been to meet the most immediately pressing requirements, such as interest payments due, accrued taxes, unpaid vouchers for materials, supplies, etc., bank loans or other maturities, including temporary loans made to meet payments due before loans could be made from either corporation, and in some instances partial loans were approved by the commission in advance of investigation of the application as to the additional amounts asked. Therefore little information is yet available as to the policies to be followed but it is to be noted that the loan to the Erie included \$923,000 for additions and betterments, and that to the Western Pacific included \$259,000 for construction work on its northern California extension.

The reports indicate that a very careful investigation is made of the need for a loan and as to the security offered, and in many cases the commission has required more collateral than that offered by the applicant. All applicants are required to show that they are unable to obtain funds upon reasonable terms through banking channels or from the general public but under the commission's interpretation of the R. F. C. act this question rests primarily with the corporation. In some cases the commission has deferred action pending further negotiations with bankers looking toward an extension of some loans. The examinations include comparisons with the commission's final or tentative valuation reports plus later net investment and include an analysis of the present and prospective financial condition, including estimates for the year.

The applications for loans filed but not yet acted upon are as follows: Aberdeen & Rockfish, \$127,000; Bamberger Electric Railroad, \$100,000; Chicago, Indianapolis & Louisville, \$2,500,000; Denver & Rio Grande Western, \$4,000,000; Fonda, Johnstown & Gloversville, \$315,000; receivers, Fort Smith & Western, \$250,000; receivers, Georgia & Florida, \$1,000,000; Meridian & Bigbee River, \$1,250,000; New York Central, \$7,000,000; Pittsburgh & West Virginia, \$7,541,032; Salt Lake & Utah, \$500,000; St. Louis Southwestern, \$31,727,750; Missouri & North Arkansas, \$1,250,000; Chicago, North Shore & Milwaukee, \$2,300,000; Cairo, Truman & Southern, \$75,000, and Apalachicola Northern, \$200,000.

Additional details regarding the applications will be found in the "Financial" news columns.



Locomotive in Service on Eleventh Avenue at Forty-First Street, New York City

Performance of Three-Power Locomotives^{*}

Operating results on West Side lines of New York Central prove this type of motive power to be highly satisfactory in switching and transfer service and show an availability factor of 85 per cent

By W. S. H. Hamilton

Assistant Electrical Engineer, New York Central Railroad

THE New York Central Lines have in service a total of 42 three-power locomotives, 36 of which are on the Electric Division around New York City. Each of these 36 locomotives is capable of operating from three sources of power; third rail, battery, or engine and battery together.

The main line of the New York Central runs into Grand Central Station, but the freight is handled on a line known as the "West Side", which leaves the main line at Spuyten Duyvil at the extreme northern end of Manhattan Island. In addition to a number of sidings there are two main yards besides the downtown terminal at St. John's Park, 12½ miles south of Spuyten Duyvil and about a mile from the southern end of the island. The largest yard is the "60th street Yard" which extends from 60th street to 72nd street on the river front, while the other one is known as the "30th St. Yard" and extends between 30th and 33rd streets and from 10th avenue to the river front, with a number of sidings and industrial spurs outside this area.

Operation from Spuyten Duyvil to 60th street is over New York Central-right-of-way, but from 60th street to 30th street operation is on 11th avenue in the middle of the city street amid a continual stream of taxicabs, trucks and all the other vehicles constituting a busy city's traffic.

The traffic is of the type that must be moved promptly

as required, and because of the other railroads serving the territory, around 30th street, is on a highly competitive basis.

Locomotive Requirements

In considering the elimination of steam locomotives from the West Side, it was considered desirable to electrify the main line tracks down to 72nd street and because of the mail and express trains this electrification will be extended to 30th street when the proposed new right-of-way is completed.

It was out of the question to electrify the present tracks in the city streets, nor was it considered economical to attempt completely to electrify either the 60th street or 30th street yards, because of the congestion, as well as the high cost involved. Attention was turned to the possibility of using Diesel engine propelled locomotives for switching in these yards and also for operating the line from 30th street south.

A number of designs of straight oil-electric locomotives were considered and one 750-hp. and one 880-hp. oil-electric locomotive were purchased. A 60-ton, 300-hp. oil-electric locomotive was also tried out in service, but was not considered large enough.

It was felt that for this service a locomotive should have the following characteristics:

1. Weight on drivers should be at least 125 tons.
2. Be capable of operating either from third rail or internal power.

^{*} Abstract of a paper presented before the Central Railway Club, Buffalo, New York, February 11, 1932.

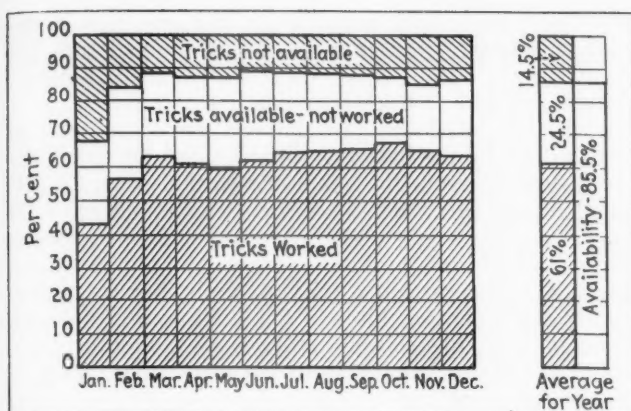


Fig. 1—Time in Service and Time Available For Service of the Three-Power Locomotives During 1931

3. Have approximately 900 engine hp. for internal power work.

4. Engine power should be divided into two or more units to prevent tying up a locomotive in case one should fail.

5. Consideration should be given to future operation under covered areas large in extent.

Characteristics of the Three-Power Locomotives

In order to meet these requirements the three-power type of locomotive was finally selected. For internal power operation a 300-hp. oil-engine-generator set and a storage battery are used, the battery to provide the peaks of power demand which occur in heavy switching service, and the engine generator set to assist the battery at times of heavy power demand and to charge the battery during times of light power demand, thus permitting continuous operation on internal power.

A sample locomotive was built and placed in service in February, 1928, and the 35 class DES-3 locomotives later placed in service were developed from experience gained from operation of the sample locomotive. These locomotives weigh 257,000 lb. in working order. All weight is on drivers, making a weight per axle of 64,200 lb., so that they are the heaviest four-axle swivel truck locomotives in service. They also had to be designed to go around a 100 ft. radius curve. A general description of the locomotives was published in the August 16, 1930, issue of the *Railway Age*.

The oil engine is of the four-cycle solid-injection type. It has six cylinders, 10 in. bore by 12 in. stroke, and develops 300 hp. at 550 r.p.m. It is direct connected to

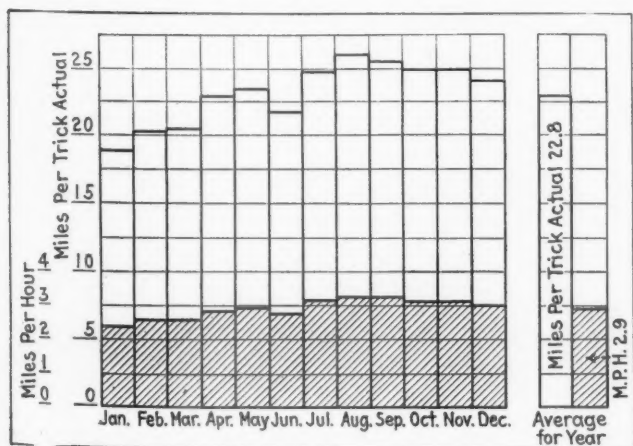


Fig. 2—Average Miles Per Hour and Average Miles Per Trick, 1931

a 200-kw. generator. The governor is of the constant speed type, the speed being approximately 575 r.p.m. at no load and 550 r.p.m. at full load.

The engine is substantially the same as furnished for a large number of locomotives by the Ingersoll-Rand Company, except that when used on locomotives without batteries a variable speed governor is used.

The storage battery consists of 240 cells of TLA-27 Exide Ironclad, made by the Electric Storage Battery Company, having an ampere-hour capacity of 650 and a Kw.h. capacity of 301. The battery is connected with all cells in series and with one side grounded. A main battery switch is provided which opens both sides of the circuit and also disconnects the two halves from each other so that only 120 cells are in series during inspection and these are not grounded.

No trouble has been experienced with insulation or leakage to ground, although these batteries have double the number of cells from the high side to ground than had been previously used. Special high-voltage porcelain insulators were designed to support the trays. Batteries are cleaned once a month by sprinkling with water in which soda has been dissolved and then washing off with hose. An air hose is then used to blow off any water that has collected.

The battery is charged by the generator only, there being no connection provided for charging from third

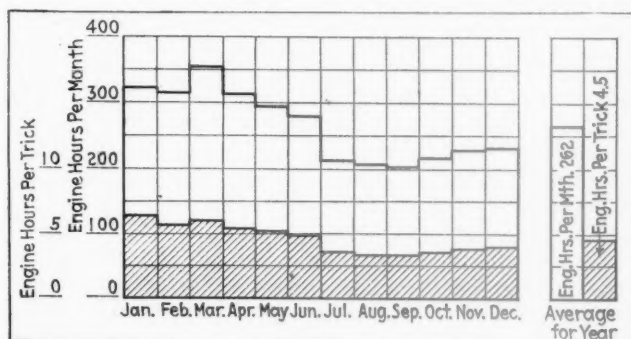


Fig. 3—Average Engine Hours Per Trick and Average Engine Hours Per Month, 1931

rail. When the battery is fully charged the current from the generator is reduced to a small amount. As load is applied to the traction motors, the generator loads up, until it reaches approximately full load, the voltage falling off with increase of load. Further loading drops the voltage enough so that the battery starts to discharge and it picks up the load quickly as the voltage is reduced below this value. The total output to the motors at any given instant is the sum of the generator and battery currents at that particular voltage.

As the load is reduced, the generator voltage increases and when high enough the battery starts to charge. This continues until the battery is fully charged or load again occurs. The battery thus floats on the generator and automatically charges or divides the load properly during discharge periods.

Locomotive Performance

The locomotives are assigned to service as follows: 11 to the 30th street yard, 11 to the 60th street yard, 8 to the Hudson Side-Electric Division, 3 to the Harlem Side-Electric Division and 3 in the shop. Total 36.

The locomotives assigned to 30th street and 60th street yards are used for switching service, those in 30th street operating entirely on internal power. The locomotives assigned to the Hudson and Harlem sides

of the Electric Division are used to handle express and mail trains down to 30th street and for way-freight and traveling switcher service between 72nd street and Harmon or White Plains, North Station. They operate on and off the third rail.

The curves and charts covering locomotive performance were prepared from selected operating statistics for the year 1931. It will be noted from Fig. 1, that the total availability is 85.5 per cent for the entire year—a very good showing—while the time in service of 61 per cent shows that they are popular locomotives with the operating department.

The actual mileage run per trick of 8 hours, month by month, averages 2.9 m.p.h., which is the usual figure obtained for switching service and is about one-half of the I. C. C. allowance of 6 m.p.h. The actual mileage, Fig. 2, is obtained from readings of odometers on one axle of each locomotive.

Engine hours per month per locomotive and also engine hours per trick give a measure of the operation on internal power. The considerable drop in engine hours per month in July, shown in Fig. 3, is due to the opening of the West Side electrification to 72nd street on June 1, it taking about three weeks to extend electrical operation to all classes of trains. Previous to that time the

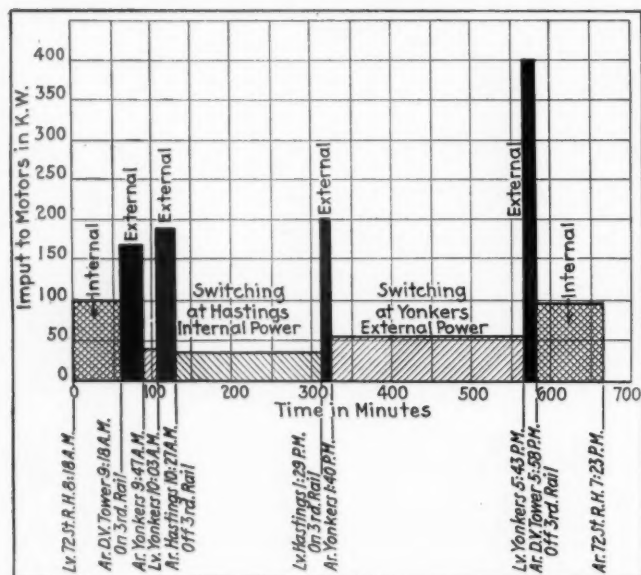


Fig. 4—Observed Performance of Locomotive No. 1525 on a Way Freight Train Over a Distance of 16 Miles

locomotives had been handling some of the trains (maximum 2000 tons) on internal power between 72nd street and Spuyten Duyvil, a distance of about 8 miles.

There has been, at times, considerable discussion as to what work this type of locomotive will actually do and for what classes of service it is best suited. The first locomotive No. 1525 was furnished with a number of instruments and meters and much data were secured, on which to base the following statements:

This type of locomotive is best suited for switching service, where the power is not on continuously and especially when used in conjunction with power supply from third rail or trolley. It has the characteristic on internal power of being able to supply large amounts of power instantly for short periods of time, as is required when kicking cars, etc.

It is not well suited for long runs with rated load on internal power only, as these discharge the battery considerably and high battery temperatures are caused

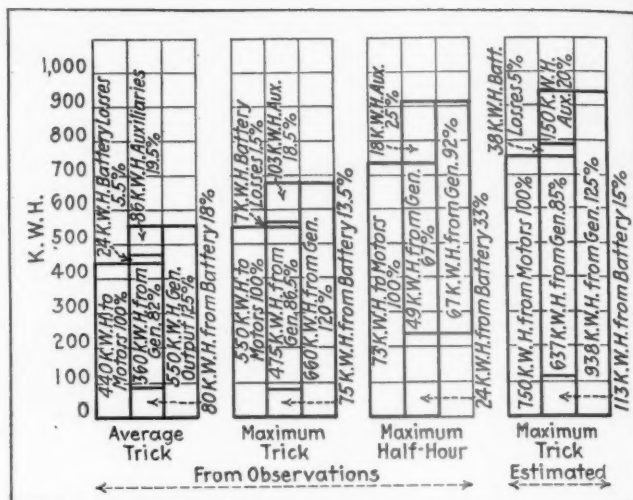


Fig. 5—Performance of Locomotive No. 1525 in Float Service Showing How Power Developed in Generator is Used

It may be seen in the case shown in Group 1 that of all the energy supplied to the motors, 18 per cent is taken from the battery and replaced by the generator—82 per cent goes directly from the generator to the motors and remainder of the power developed by the generator supplies battery losses and operates auxiliaries.

by the heavy recharging necessary. This type of locomotive has been used on continuous runs of 8 to 13 miles on internal power, but it does not work to best advantage when used on continuous runs of more than 2 or 3 miles.

For long runs the external power should be available. For way freight and traveling switcher service, where operation is partly from external and partly from internal power, the locomotives are in their element and permit this service to be very economically handled, since the cost of electrification of sidings and industry tracks can be saved. In the case of industrial plants along the right-of-way this is an important item, not only because of the cost involved, but also the physical difficulties in connection with electrifying many of these tracks.

The observed performance of locomotive 1525 on a way freight train for a distance of about 16 miles and return is shown in Fig. 4. The train handled was about 1100 tons, approximately half the tonnage rating of the locomotive. First comes a road run on internal power for about eight miles, then a road run on external power for eight miles, with a short period of switching on external power, then switching on internal power, then a short run on external power, switching on ex-

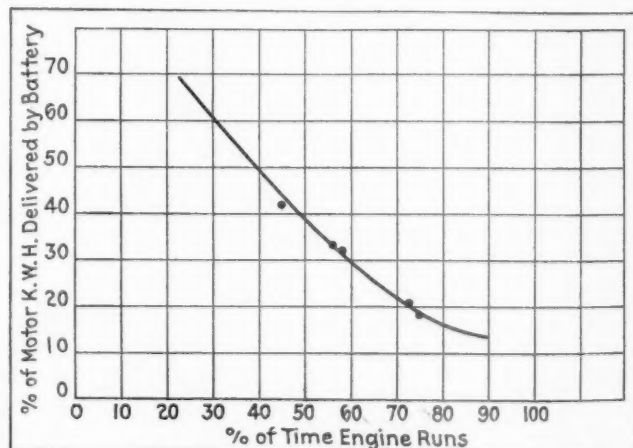


Fig. 6—The Amount of Power Delivered by the Battery Varies with the Time the Oil Engine is in Operation

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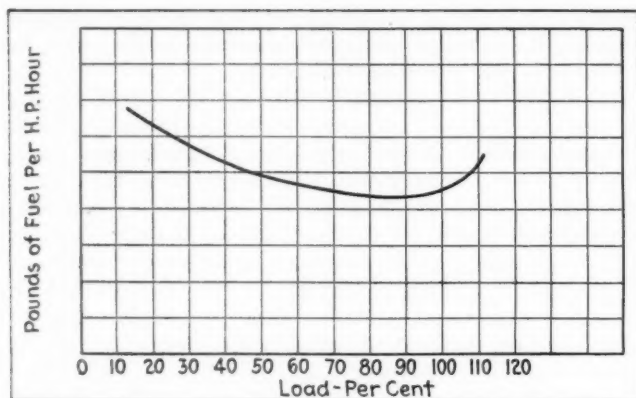


Fig. 7—Relation of Fuel Consumption to Engine Load

ternal power, a short road run on external power and finally a road run on internal power back to the starting terminal. Incidentally it was then the practice to work the locomotive a shift in float service at night and send it out on the way freight the next day.

From the time the class DES-3 locomotives went into service in August, 1930, until June, 1931, they handled 2000-ton trains in regular service from 72nd street to Spuyten Duyvil on internal power and from thence on external power. With a train of this weight the power required is about double that shown in Fig. 4.

It should be noted that only about 50 kw.h. per hour input to the motors is required for switching service even on external power. Fifty to 60 kw.h. per hour input to motors has been found to cover the average requirements of switching service, but it has also been found that peaks of 600 to 800 kw. are used momentarily especially when rapid acceleration is required, as when kicking cars, etc.

The high horsepower obtainable on external power is the reason for the excellent record of straight electric locomotives in switching service for many years and the fact that this is available when on electrified tracks, where the traffic density is usually heavy, makes this three-power type of locomotive so highly adaptable.

Battery Equals Two Engines for Short Periods

When operating entirely on internal power the capacity of the battery and the size of the oil engine limit the work that can be done by the locomotive. There has been a great deal of misunderstanding concerning the duty on the battery for a given amount of work done by the locomotive. Fig. 5 shows in graphical form some results obtained from locomotive 1525 in float service.

The first group shows the distribution of kilowatt-hours for an average trick. It will be noted that the input to the traction motors was 440 kw.h., or an average of 55 kw.h. per hour. The battery furnished, by discharging, 80 kw.h. or 18 per cent. The battery losses in recharging were 24 kw.h., or 5.5 per cent. It will be noted that the total generator output was 550 kw.h. making the electrical efficiency of the locomotive 80 per cent.

The second group shows the conditions on the maximum observed trick (based on motor kw.h. input). The third group shows conditions for the maximum half hour observed, and the fourth group shows the estimated maximum trick that this locomotive can perform. The latter is based on the locomotive being in three-trick service and with a total battery discharge for 24 hours of 125 per cent of the rated 6-hour capacity, which is the limit due to permissible temperature

rise. Locomotive 1525 actually worked one trick in another service with this input to the traction motors but only 890 kw.h. output was required from the generator, as compared with 938 kw.h. estimated.

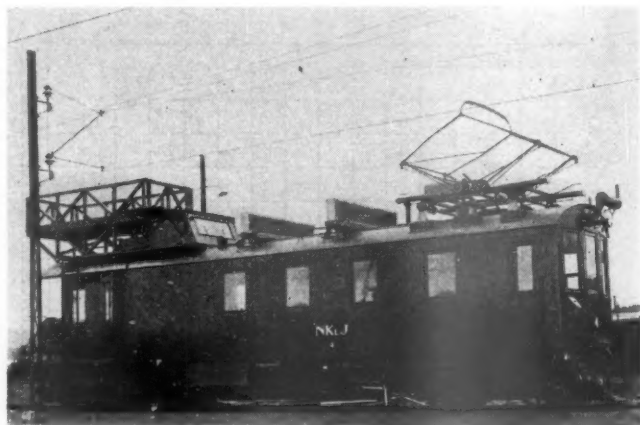
It will be noted that a relatively small amount of work is done by the battery. Most of the energy is delivered directly from the generator to the motors. The peak demands in switching service while high are only of short duration, and while very important in securing prompt and rapid movement of cars do not represent many kilowatt-hours in a trick of eight hours. There is a popular misconception of these locomotives which has the battery furnishing practically all the motor kw.h. and then being recharged from the generator. As may be seen this condition does not occur in practice. The curve, Fig. 6, has been prepared further to illustrate the same point and is based on data taken on locomotive 1525.

It will also be noted that as the engine is operated a greater percentage of the time, the percentage of the motor kw.h. delivered by the battery is reduced until a minimum of about 15 per cent is reached. These tests indicated the desirability of operating the engine practically all the time the locomotive is in use, with the exception of periods when standing idle or when certain moves have to be made on battery alone, and this is the practice followed on these locomotives. Light engine moves are usually made on battery, with engine shut down.

The average load on the generator, based on the time it is running, is usually about 40 per cent of its rated load on average tricks, and about 70 per cent on maximum tricks. The instantaneous load varies from about 10 per cent to 100 per cent and the fuel is limited beyond this point to prevent overloading the engine.

The fuel economy of the engine is good, since these average loads bring the load into the part of the fuel consumption curve where the engine operates near its best economy, as shown in Fig. 7. This feature makes the over-all fuel economy as good or better than a locomotive with larger engine horsepower and no battery doing the same work, which would necessarily operate at a considerably lower load factor. The DES-3 locomotives averaged 43 gallons per trick, or 9.5 gallons per engine hour for the year 1931. When operating on internal power all the time they use from 65 to 75 gallons per trick.

* * *



Combination Electric and Gas-Electric Work Car for Inspection and Maintenance of Overhead Lines Used on the Nordmark-Klarälven Railway in Sweden—An Observation Window Is Placed in the Front End of the Cupola—The Driving Axles Are Equipped with Differentials

Communications . . .

What Will You Do to Defend the Railway Industry?

STAPLETON, S. I., N. Y.

TO THE EDITOR:

Your editorial on responses to the "call for volunteers" I think covered the ground completely. I agree with you that real leadership is needed and right now because Congress and the I. C. C. are considering remedial legislation.

Since Congress and the I. C. C. are regulating the largest industry in the United States it behooves those who are wholly and partially dependent upon railroad business to stand up and be heard. The most effective way is through organization under proper leadership.

Why cannot the railway supply industry from the Schwabs and Vauclains down to the smallest dealer come together in one huge association for the purpose of educating Congress, the I. C. C. and the public to the real relationship between railroads and business? Many of our large cities have hundreds of such concerns, each city could have its own "section" under its own leadership, for gathering data—facts and figures for distribution through its employees to the public and Congress. These same data could be brought to the attention of the railroad employees through their monthly magazines.

Can you imagine what might happen in Washington if only one-half of the railroad employers and the employees of the supply industry were to put their case squarely to their legislators? In normal times there are something like 2,000,000 railroad employees and 1,500,000 in the supply industry. Adopt a slogan. I suggest: "When the railroads prosper, you prosper." Would Washington listen? I think it would. But we should get going at once.

W. VOLKHARDT,

President, American Railway Hydrant & Valve Co.

The Government's Obligation

CHICAGO.

TO THE EDITOR:

Acts of Congress relative to interstate commerce should conform to the limitations specified in the Constitution and repeatedly emphasized by the United States Supreme Court, that the government's power over interstate commerce carriers is limited to the enforcement of the reasonableness of rates and non-discrimination as to both rates and services. Beyond that, the ruling is and has been that the railroads must be considered and regarded as "private property," subject to the common law governing private property. This means that the first obligation of the government is to restore to the railroads self-management, self-expression and self-determination, subject to constitutional limitation.

The railroads are the key industries. Their prosperity is of prime importance to the further development of the nation. To guard their constitutional rights, Congress should enact a law creating an Interstate Commerce Commission of three members, to be appointed by the President, by and with the consent of the Senate. These three men should be the ablest men obtainable, should hold office as commissioners during the life of the act creating the commission, and should be compensated by salaries comparable to those paid railroad executives. Such selection, tenure of office and compensation would remove them far from political influences.

In the new "Interstate Commerce Act," which Congress should enact, the requirements for reasonableness of rates and non-discrimination should be made applicable to all interstate common carriers, whether by land, by water, by air or a combination of any two or three. This meets the requirements of the Constitution, whose framers knew nothing about railroads. The "Act" should empower the commission to see that the rates for interstate transportation, charged singly or jointly by

common carriers, are reasonable and that rates and services shall be given equally to all and shall in every respect be non-discriminatory.

In the "Act," many of the beneficial practices now in effect should be continued if they are of advantage to the public, the shipper and the railroad. Other subjects of a mechanical or operating nature, or relationships with the public and employees, should be left with the common carriers or the states in which the railroads operate, far preferably with the railroads themselves.

But the making of rates should be in the hands of the common carriers. The "Act" might instruct the rail common carriers to appoint traffic bureaus manned by the ablest traffic men of the carriers and with representatives from the industrial and agricultural traffic groups, which bureaus at the expense of the carriers or groups, after holding conferences with the parties affected by the proposed changes in rates, should endeavor to reach an agreement as to the reasonableness of the rates before presenting them to the commission for approval. Thus only can a mental concept as to a rate be laid aside and a reasonable rate be attained. Its reasonableness is due to its practicability to move the commodity without favoritism. Thus the government, the carriers and those affected by the rates would co-ordinate their interests and co-operate for the commercial upbuilding and development of the nation.

In the shadow of recent events there is a fear of excessive capitalization. To prevent this for common carriers, and as an aid to a determination of reasonable rates, the "Act" might provide for instructions to the commission to co-operate with the state in which the common carrier seeking increased capitalization is chartered, or if the carrier does not operate in the state in which it is chartered, then in the state where it has its principal offices, to act jointly in matters of increased capitalization. The framers of the Constitution stressed the rights of the state in matters of commerce, and this is more applicable today when the states have large interests in public highways and municipalities own the airports.

Interstate commerce was one of the stumbling blocks in the framing of the Constitution. It was feared that the Union might assume such prerogatives as to deprive a state of its commercial rights. Seven years before the Constitution was adopted, the Commonwealth of Massachusetts enacted a law which, based on principle, has become the basic law of nations, that a nation to continue must be a nation of law and not of men. This is the obligation of the government to the railroads today.

When the carriers are again granted self-management, self-determination and self-expression, without discrimination as to the method of transportation, but in line with the spirit of a republic by a co-ordination of action of the government, the public and the carriers, it will be a long step towards that prosperity long hoped for.

W. H. MANSS.

A NEW YORK CITY RAILROAD CENTENARY.—The New York Evening Post reprinting from its issue of February 24, 1832, records as below, one of the first steps in the construction of the New York & Harlem, the original corporation owning that part of the main line of the New York Central which includes the Grand Central Terminal.—"The ceremony of breaking ground for the Harlaem Rail Road was yesterday performed at Murray's Hill, on the Fourth Avenue. [Three or four blocks south of the present terminus at Forty-second Street. The original terminus was at Centre Street, about three miles farther south. The rock had previously been bored and, on the arrival of the officers of the company, the members of the Common Council, the engineers and others invited to witness the ceremony, thirteen successive blasts were given. The President of the Company, John L. Mason, addressed the persons present."

Odds and Ends . . .

"Births in Berths"

According to the Frisco Employees' Magazine, two Frisco trains were recently overtaken enroute by the stork. One baby was born to a passenger on Train 805 shortly after it had left St. Louis, while the other baby was born on the "Meteor" while it was on its way to St. Louis. The report does not state whether either child was named "Frisco"—which we believe is the customary thing to do on such occasions.

A Not-So-Mild Winter

If you want to get a rise out of any officer on the Denver & Rio Grande Western, repeat the old adage that depression winters are always mild. This one has been a mild one in many parts of the country but not in southern Colorado. The Denver & Rio Grande Western has already spent more than \$60,000 so far this winter fighting snow on its narrow gage lines, and it will have to spend between \$50,000 and \$75,000 more before the lines to Silverton and Pagosa Springs are opened.

On Time All the Time—Practically

The railways did not have much traffic last year, but they did a good job of moving what traffic they did get. For example, an all-time record for on-time handling of perishable freight and livestock was established by the Indiana Harbor Belt in 1931, according to W. J. O'Brien, general manager. During the year the road handled 266,187 carloads of perishable freight and livestock, requiring the operation of more than 12,000 trains, of which 99.59 per cent were moved according to schedule.

The Canadian Pacific's Champion Cow

A four-year old Holstein cow on the Canadian Pacific's farm at Strathmore, Alta., set a record for Canada during 1931, when she produced 30,464 lb. of milk and 1,160 lb. of butter. She is the first cow in Alberta to produce more than 30,000 lb. of milk during one year. Another C. P. R. cow on the same farm carried off the butter record for Canada last year, producing 1,200 lb. She was second highest in milk production also. There is inspiration for all in the manner in which these railway workers have done their bit.

Abraham Lincoln, Valuation Engineer

Always quick to seize a favorable opportunity, the publicity department of the Illinois Central took advantage of the observance of the birthday anniversary of Abraham Lincoln to point out that the first valuation of that road was made in July, 1859, under the direction of the future Civil War president. At that time the Illinois Central consisted of 705 miles of road extending from Cairo, Ill., to East Dubuque, with a "branch" to Chicago. The Interstate Commerce Commission has been trying to put a valuation on the Illinois Central since 1914, while Lincoln did it in one month. He must have been a great man.

"The Boston & Maine Presents—"

Advocates of co-ordination of the various forms of transportation have urged for years that the railways should consider themselves transportation companies and not merely railroad companies. The news from Boston now indicates that the time may come when, strictly speaking, they will be neither transportation companies nor railroad companies but simply companies. Casting about for ways to increase its revenues, the Boston & Maine hit upon the happy idea of running a movie. Now a part of the North Station in Boston is being remodeled to provide for a movie theatre. The

theatre will seat 350 persons and will be open daily, and travelers who have an hour and a half to wait for their trains will be able to see the whole show, from the news-reel to Mickey Mouse.

Visitors Welcome—With Reservations

In one middle-western railroad office they have developed the handling of casual callers into a science. The following notice is prominently displayed:

Time Allowed for Interviews in This Office

Friendly calls	0 hrs.-2 min.-1 sec.
Friendly calls when busy	0 " 1 " 1 "
Life insurance agents	0 " 0 " 1 "
Friends with scheme	0 " 0 " 5 "
Friends with scheme willing to let us in on the ground floor	0 " 0 " 0 "
Friends who ask us to drink	? " ? " ? "
Friends who ask us to eat	0 " 59 " 0 "
Those wishing to pay old bills	58 " 59 " 58 "

A Husky Fee for Highway Use

To support their contention that they have a right to conduct a private business on public property without any special payment or restriction, motor transport operators have been known to hark back to old theories of the rights and privileges of citizens and their freedom to use the "King's Highway." It seems that their reference is not so well advised. The Railway Gazette (London) quotes from an article in the Yorkshire Post, which describes fast stage coach services between Newcastle and London, approximately 270 miles, in 1837. Four stage coaches were used to maintain this service and their owners paid the equivalent of approximately \$6,000 annually per vehicle in taxes and fees for the use of the highway. This figure makes the modern license fees and gasoline taxes paid by motor coaches appear rather modest.

A New Slant on the Fuel Hearings

Officers who have read about, observed or participated in the hearings of the Interstate Commerce Commission in its investigation under Ex Parte 104 concerning the fuel practices of the railroads probably have gained the impression that what the commission has in mind is that the railways, or at least some of them, pay too much for the coal which they use. That is what we thought, too, but it appears that we were wrong. According to "Labor," house-organ of the unions, that is not the idea at all. These, it says, are the facts: "The commission is conducting these hearings in an effort to determine the actual fuel purchasing policies of the railroads. The charge has been made repeatedly that railroads and utilities, which take about a third of the output of soft coal mines, use their mass purchasing power to get fuel below its actual cost."

Only Six Left

The ranks of the seven brothers employed on the Pennsylvania have at last been broken. One of them has been retired on pension. He is David E. Banks who ended his service as assistant freight train master of the Middle division after 54 years on the railroad. The oldest of a large family of boys, Mr. Banks started with the Pennsylvania as a telegraph operator in 1878. Presently, one by one, his brothers followed him into the Pennsylvania service, until in 1905 the enrollment of C. R. Banks, now a ticket clerk on the Middle division, saw all seven of the brothers working with the same company. The other brothers are L. L. Banks, passenger train master, Middle division; John D. Banks, train dispatcher, Philadelphia division; A. B. Banks, passenger conductor, Middle division; G. W. Banks, train dispatcher, Oil City, Pa.; and E. J. Banks, train director, Pittsburgh division.

NEWS

Betterment Loans from R. F. C. Recommended

H. J. Haas would concentrate on improvement of railways and thus aid all

Declaring it to be most advisable at this time to concentrate the nation's efforts on some particular industry, the improvement of which would promptly benefit other businesses, H. J. Haas, vice-president of the First National Bank of Philadelphia, Pa., and president of the American Bankers Association, recommended in a recent address that the Reconstruction Finance Corporation be permitted to make loans to railroads not only to take care of maturing obligations but also to provide funds for temporary financing when such funds are not obtainable from other sources.

Mr. Haas quoted railway traffic, operating and financial statistics to emphasize the ramifications of the railway industry and the manner in which it affects our national economic life.

"The railroads," he continued, "will need \$405,000,000 to take care of maturing obligations during 1932, but to provide this amount alone will not suffice. This is only repairing their fences, and while it is necessary to insure the public, banks, savings institutions, fire and life insurance companies and all holding railroad investments that these shall be met, this in itself will not turn the wheels of industry. The railroads are badly in need of modern locomotives, rails, electrical equipment and all that goes with maintenance.

"All this requires financial assistance and with their present earnings this is not possible by public financing. The Reconstruction Finance Corporation offers the solution. Section 5 provides: 'Hereafter no loan or advancement shall be made by the corporation for the purpose of financing any enterprise not initiated, set on foot, or undertaken prior to the adoption of this Act.'

"With the funds available the railroads could effect material savings by purchasing modern locomotives. Actual figures show that the savings to the railroads would enable them to pay interest on the investment and amortize the cost in a period of 15 years, and they would have the use of these same locomotives for an additional period of 10 to 15 years and without cost. It is most expensive to maintain physically old or economically obsolete locomotives. Studies of some thousands of locomotives in actual operation show that over a series of years repair costs increase about 3.7 per cent with

each advancing year of physical age. Economy in locomotive operation has to be purchased by a wise capital investment in new locomotives annually and a proper annual retirement of those unfitted for economical present service, whether because of physical age or of economical obsolescence.

"The purchase of locomotives would involve orders for steel, copper, brass, nickel, lumber, fuel, gravel, sand, etc., and the employment of office and plant organizations, besides furnishing freight transportation for the railroads themselves. The benefits would be passed on down to the corner grocery store and the long hoped for business revival would begin to be an actuality."

After further references to statistics of railway finance Mr. Haas held that the figures quoted "indicate the extent to which our people are interested directly and indirectly in the railroads' problems." Continuing next through a discussion of the manner in which the railroads are hampered in meeting changing conditions by restrictive regulation the speaker reiterated his conviction that great benefit would accrue to all if the carriers were aided in their temporary financing of capital improvements through loans from the Reconstruction Finance Corporation.

R. A. O. A. Offices Moved

The offices of the Railway Accounting Officers Association have been moved from the Woodward Building, Washington, D. C., to the Transportation Building, 17th and H streets, N. W.

C.N.R. Deficit in January

Gross revenues of the Canadian National for the month of January, 1932, were \$10,948,329, a decrease of \$2,808,546, as compared with the corresponding month of 1931.

In the same period operating expenses were reduced by \$2,732,351 from the 1931 figure, to a total of \$11,536,451, leaving a net operating deficit of \$588,122, as compared with a net operating deficit of \$511,928 in January, 1931.

The C. P. R. in January

Net operating revenues of the Canadian Pacific for the month of January, amounted to \$649,939. This contrasts with \$874,502 in January of last year, a decrease of \$224,563. Gross revenues for the month amounted to \$8,993,956, being a decrease of \$2,639,038 from the gross of \$11,632,995 reported for January of last year.

Operating expenses, \$8,344,017 for the month, compare with \$10,758,492 in January of last year, a decrease of \$2,414,475.

Hearings on Four-System Plan Continue

Porter hears Southern interests in what may be last week of sessions

Hearings before Chairman Porter of the Interstate Commerce Commission on the application of the Baltimore & Ohio, the Chesapeake & Ohio, the New York Central and the Pennsylvania for approval of their four-system plan of consolidating the eastern railways outside of New England were expected to be concluded by the end of this week.

Most of the time on Monday and Tuesday was taken up with the opposition of the Southern, the Louisville & Nashville, and commercial interests in the South, Chicago, and Indiana to the proposal that the Chicago, Indianapolis & Louisville be allocated to the Baltimore & Ohio, instead of being left in joint control of the Southern and L. & N. This was opposed on the ground that the Monon is part of extensively used routes between the South and Chicago competitive with the routes of the east-and-west lines, and that an east-and-west line would be more interested in traffic to and from north Atlantic ports. Correspondence was introduced between President Willard of the Baltimore and Ohio and officers of the Monon and the roads that control it in which he promised to take no steps to obtain control of the Monon until and unless the present owners of the property were quite willing to sell.

Testimony in opposition to the plan was given by J. G. Kerr, assistant to the vice-president of the L. & N.; E. R. Oliver, vice-president of the Southern; R. V. Taylor, commissioner for the city of Mobile and former member of the Interstate Commerce Commission; and representatives of commercial interests in Indiana, Chicago, New Orleans, Chattanooga and other cities. Much testimony was also offered in opposition to the proposal to allocate the Chicago & Eastern Illinois to the Chesapeake & Ohio.

S. M. Rogers, president of the Elgin, Joliet & Eastern, which under the plan would be allocated jointly to the four systems, testified that it would be contrary to the purpose of the interstate commerce act to permit one or all of the applicants to acquire control of the E. J. & E. It interchanges twice as much traffic with railroads other than the four applicants as it does with them and at present all railroads, shippers, and industries have equal access to the roads. This situation, he said, should not be disrupted by allocation of the E. J. & E..

to any of the proponents of the four-system plan.

Leonard P. Sims, of the Detroit Board of Commerce, asked the commission not to approve the plan until after the Baltimore & Ohio obtains a "real" entrance to Detroit by acquiring a half interest in the Detroit & Toledo Shore Line, instead of having only trackage rights. He also said his organization objects to any "wholesale mergers" of railroads and to any plan that attempts to forecast the future too much.

Representative P. J. Boland, of Pennsylvania, appeared on behalf of the city of Scranton, Pa., to ask that the New York Central, if it is allowed to acquire the Lackawanna, be required to maintain the shops of the Delaware, Lackawanna & Western at Scranton.

A. L. Holton, vice-president of the Interstate, a short line in Virginia, objected to the allocation of his road to any system.

A series of exhibits showing the depreciation in the market value of railroad stocks purchased by companies affiliated with the Van Sweringens, the Pennsylvania and the Baltimore & Ohio was put into the record by H. T. Newcomb, general counsel of the Delaware & Hudson, through H. D. Chamberlain, comptroller, over the objection of counsel for the applicant companies. These were offered, Mr. Newcomb said, for the purpose of showing the "bad investments" made by these companies and to cast some doubt on their ability to finance their present proposals. The tables were based on holdings of the various companies as of December 31, 1930, the prices paid, and the market prices as of February 9, 1932. On that basis the "loss" of the Alleghany Corporation was stated as \$179,811,800; that of the Chesapeake & Ohio on its holdings of Pere Marquette stock as \$31,733,218; that of the Virginia Transportation Corporation as \$42,198,638, and that of the Van Sweringen Corporation as \$14,375,000. The holdings of the Peninroad Corporation were shown to have depreciated by \$76,249,232, and those of the Pennsylvania Railroad and Pennsylvania Company in the New Haven, Lehigh Valley and Wabash by \$121,557,411. The market value of the Baltimore & Ohio holdings in the Buffalo & Susquehanna, the Buffalo, Rochester & Pittsburgh, the Western Maryland and the Reading had fallen \$51,912,640.

Mr. Newcomb also tried to put into the record a statement regarding the activities of the Van Sweringen and Pennsylvania holding companies which was made by Commissioner Eastman before the House committee on interstate and foreign commerce as chairman of the commission's legislative committee. H. W. Bikle, of the Pennsylvania, objected to this unless Mr. Eastman could be called as a witness for cross-examination. This, however, could not very well be done, said Mr. Bikle, since Mr. Eastman is a "judge" in this case; but the records from which Mr. Eastman had drawn conclusions might be introduced. Mr. Newcomb said that what Mr. Eastman said as chairman of the legislative committee was an official record and that it

was the commission speaking; but Chairman Porter declined to admit the statement to the record.

C. N. R. Earned a Million in 1931

The Canadian National had an operating net of one million dollars in the calendar year of 1931, said Hon. Dr. Robert J. Manion, Minister of Railways, last week. The total appropriation made by Parliament for the publicly-owned system was \$112,000,000. The company was \$56,000,000 short of meeting all their obligations, including interest due the investing public. Appropriations made, in addition to the sum needed to pay interest included: New equipment, \$14,000,000; additions and betterments, \$8,000,000; Maritime freight rates act. (i.e., a subsidy to shippers in the Maritime provinces) \$10,000,000; Montreal terminals, \$6,000,000; Toronto terminals, \$2,000,000; branch line construction, \$3,000,000; steamship services, \$1,000,000.

Meeting to Discuss Rail Flaw Detection

The regular monthly meeting of the Western Railway Club for March will be held one week earlier than usual, namely on Monday evening, March 14, at the Hotel Sherman, Chicago, in order to permit a joint session with the American Railway Engineering Association and the Maintenance of Way Club of Chicago, to be devoted to a discussion of flaws in steel rails and methods of detecting them. The announced subject is "Rail Flaw Detection on the New York Central," the speaker being C. B. Bronson, assistant inspecting engineer, New York Central system. Mr. Bronson's paper will include a description of the New York Central's new detector car. It will be illustrated with lantern slides and motion pictures.

Recapture Liability Estimated on Eleven-Year Basis

An estimate of the recapture liability of the railroads if it were to be computed on the basis of an average for the 11-year period from 1920 to 1930, inclusive, has been sent to the House committee on interstate and foreign commerce by Commissioner Eastman of the Interstate Commerce Commission and incorporated in the printed record of the hearings on the bill to revise Section 15a of the interstate commerce act. On this basis the estimated liability would be \$237,521,426 for 163 railroads, including \$222,120,453 for 45 Class I railroads, as compared with the estimate of \$361,000,000 for 446 roads computed on an annual basis which Commissioner Eastman had previously submitted. For comparison with the 11-year table, however, Mr. Eastman submitted another estimate on an annual basis covering 448 roads having an estimated liability of \$359,459,141. One-half of the Class I roads subject to recapture in one or more of the years on an annual basis would be free from recapture liability on the 11-year basis, according to this estimate. In a letter of transmittal Commissioner Eastman said that these figures are "rather rough estimates" and that "it should also be noted that if the year

1931 should be included in the period the total recapturable amount would be still further reduced materially, and that if the year 1932 should be included it seems probable, on the basis of present railroad earnings, that a still larger reduction would be made."

F. L. Hutchinson Dies

Frederick Lane Hutchinson, national secretary and executive manager of the American Institute of Electrical Engineers, died at the age of 65 of heart disease on February 26, 1932. Mr. Hutchinson was born in Elizabeth, N. J., and began his career in a clerical capacity with the Pennsylvania in New York. He was graduated as an electrical engineer from Cornell University in 1893 and was employed successively in the testing and sales departments of the Westinghouse Electric & Manufacturing Company, as publication department manager of the C. W. Hunt Company, New York, and as advertising manager and manager of electrical sales of the National Electric Company, Milwaukee, Wis. In 1908 he was made assistant secretary and in 1911 secretary of the American Institute of Electrical Engineers. He has been responsible in considerable part for the present organization of the institute.

Railroad Report on Emergency Freight Rate Increase

Reports of railroad revenues and expenses to the Interstate Commerce Commission for January include a separate statement of the amount received by each road from the temporary emergency increase in freight rates authorized by the Interstate Commerce Commission in Ex Parte 103. All reports are not in as we go to press but some of the larger amounts reported are as follows: Pennsylvania, \$570,217; New York Central, \$460,212; Baltimore & Ohio, \$235,000; Chesapeake & Ohio, \$151,191; Reading, \$97,217; Delaware, Lackawanna & Western, \$65,305; Erie, \$112,559; Illinois Central system, \$136,340; Chicago, Burlington & Quincy, \$95,188; New York, New Haven & Hartford, \$87,433; Lehigh Valley, \$71,439; Central of New Jersey, \$59,100; Southern, \$119,228; Atlantic Coast Line, \$37,274; Northern Pacific, \$26,792; Great Northern, \$27,218.

Professor H. E. Boardman Dies

Howard Edward Boardman, Dudley Professor of Railroad Engineering in the Graduate School of Yale University, New Haven, Conn., died of pneumonia at his home in New Haven on February 28. Although appointed to the professorship on July 1 last, Professor Boardman had devoted the first few months of his incumbency to a thorough study of the present railroad situation, to which end he had been in constant touch with railroad executives throughout the country. His course was taking shape in his hands, but he had not yet started actual instruction of students.

The Dudley endowment fund, under which Professor Boardman was the first appointee, was established jointly by the late Lucy B. Dudley and her husband, the late Dr. P. H. Dudley, formerly consult-

ing engineer, New York Central lines, who was widely known as an authority on steel rails. It was created specifically to embody research in railroad engineering matters through work in conjunction with railroad officials and experts, and to instruct graduate students in methods of meeting present-day railroad problems.

A detailed review of Professor Boardman's 33 years of varied experience in railroad and general engineering work was published in the *Railway Age* of July 4, 1931, page 31, at the time of his appointment.

Requirement of Power Reverse Gear Proposed by Examiner

Examiner John L. Rogers of the Interstate Commerce Commission has submitted to the commission a proposed report on the complaint filed by the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen and Enginemen recommending that the commission find that the safety of employees and travelers on railroads requires that steam locomotives used in road service having a weight in working order of 150,000 lb. or more on driving wheels, and locomotives used in yard service having a weight in working order of 130,000 lb. or more on driving wheels be equipped with power reverse gear.

While the defendant railroads had urged that the carriers generally are in such financial condition that they should not be required to comply with such a requirement, Examiner Rogers argued that since the recommendation is that the locomotives be equipped when they are shopped for Class 3 or heavier repairs and as a large proportion are out of service now, the expense will be distributed over a period of approximately four years. Clearly, he said, the carriers would not have equipped over 28,000 locomotives with power reverse gear and would not contemplate so equipping practically all new locomotives if such gears did not contribute to efficiency of operation or if power reverse gear is less safe than the hand reverse gear.

President Favors "Reform" of Railway Regulation

Legislation "to reform railway regulation" was again mentioned by President Hoover as one of the "further, non-partisan measures of reconstruction" which he said he was confident would be dealt with by Congress in the same spirit of co-operation that other such measures have already received, in a statement issued on February 27 in comment on the passage of the Glass-Steagall bill to expand the facilities of the Federal Reserve system.

The President has made several such references to a revision of railway regulatory laws in the past few weeks without specifying what he had in mind, although developments have led to speculation as to whether he referred to the proposed revision of Section 15a, or was merely speaking generally. In his message to Congress in December he said that the "methods" of railway regulation should be revised and he commended to the

early consideration of Congress "the important and far-reaching recommendations upon the whole subject" which were to be made in a few days by the Interstate Commerce Commission. Then, in a special message on January 4 urging prompt action on proposals for economic relief he again referred to "revision of the laws relating to transportation," which he said "would strengthen our principal transportation systems and restore confidence in the bonds of our railways." In an address before the American Bankers' Association at Cleveland on October 2, 1930, the President, after saying that the most available method of relief to unemployment is extension of public work and construction in the utilities, railways and heavy industries, said that "the railways have been handicapped by some provisions of the transportation act of 1920" and that "with wider public vision the railways could be strengthened into a greater balance wheel of stability."

Reduction in I.C.C. Appropriation Recommended

A reduction in the appropriation for the work of the Interstate Commerce Commission for the fiscal year ending June 30, 1933, to \$7,228,179, which is \$2,184,294 less than the appropriation for 1932 and \$1,533,231 less than the Budget bureau estimate, was recommended by the House committee on appropriations in its report on the independent offices appropriation bill. Of the reduction as compared with the Budget estimate, the committee said, \$1,483,321 represents the elimination of work occasioned by the recapture provisions of the law in view of the belief of the committee that "recapture will be retroactively repealed at this session of the Congress, since the legislation for the repeal has the full endorsement of the Interstate Commerce Commission and there has not been developed any substantial opposition to the repeal."

As compared with the Budget estimate, \$1,000,000 of the reduction is taken from the appropriation for the Bureau of Accounts and \$483,321 from that for the Bureau of Valuation. However, the amount recommended for the Bureau of Valuation, \$2,750,000, is \$804,368 less than the appropriation for the current year. The recommendation for salaries and expenses is \$2,875,354, a reduction of \$215,546 as compared with the current appropriation; that for accounting is \$383,560, a reduction of \$1,120,860; that for safety of employees, etc., is \$511,732, a reduction of \$22,928; that for signal safety systems is \$47,174, a reduction of \$1,086; that for locomotive safety inspection is \$485,359, a reduction of \$19,506; and that for printing and binding is \$175,000, the same as for this year. Reductions are to be effected in part by a policy of not filling vacancies as they occur and by a reduction in the per diem allowance for traveling employees in lieu of subsistence from \$6 to \$5.

The Budget bureau had recommended \$3,233,231 for valuation, which was \$321,137 less than the commission had asked. Commissioner Lewis, in testifying before a sub-committee on the bill, had

stated that \$300,000 had been saved from the last appropriation and that the number of valuation employees had been reduced to 956.

Commissioner Eastman told the committee that it was the feeling of the director of accounts that due to the fact that the amount of the recapture work has in part made it impossible in recent years to make the general examinations of carriers' accounts in addition to the income accounts "considerable laxity has been developing in the carriers' accounting" and that "with our present force, if we did not have the recapture examinations, it would be possible, if we did nothing else and confined ourselves merely to the Class I railroads, to make a general accounting examination once in every three years of each carrier." He also said that if relieved from that work the commission ought to begin the general accounting examinations which it used to conduct, but that it has been possible to get along without the general examinations because of the fact that "the recapture examinations were a substitute for them to a considerable extent."

Outlook Brighter, Says Atterbury

"The country looks to the railroads to lead us back to better things and brighter days," said Gen. W. W. Atterbury, president of the Pennsylvania, at the second annual dinner of the Transportation Club of the New York zone of that road at the Hotel Pennsylvania, New York, Monday evening, February 29. Continuing, General Atterbury said, "Recent developments do point definitely in the direction of improvement. I am greatly pleased with the measures taken at Washington to strengthen our banks and general financial conditions, to release credit and to provide sound assistance to our railroads in going ahead with improvements and meeting obligations. Of similar character are the steps being taken toward dealing with the problems of unregulated and unfair competition against the railroads and improving regulation of the railroads themselves. Railroad employees have demonstrated their own understanding of existing conditions and necessities in a signal manner and I commend them most heartily for it. * * * I expect no miracles. I do believe we are justified in looking for signs of the beginning of a healthy recovery."

Other speakers on the program included George W. Scott, president of the club; Col. A. F. Foran, comptroller of U. S. Customs, Port of New York; Thomas H. Beck, president, Collier's Weekly; Dudley Field Malone, international lawyer; Roy V. Wright, managing editor, *Railway Age*; Elisha Lee, vice-president, Pennsylvania Railroad; Herbert Bayard Swope, formerly executive editor, New York World; James A. Farley, chairman, New York State Athletic Committee; and R. C. Morse, assistant general manager, New York Zone, Pennsylvania Railroad. Vice-President LeBoutillier acted as toastmaster. At one of the tables were seated nine pensioners, whose total ages aggregated 661 years and whose years of service totaled 429. They were given a rousing reception and

one of them, W. C. Jasper, formerly an engineer on the Maryland division, made an impromptu address which was enthusiastically received. There were 1,300 in attendance.

I.C.C. Hears Arguments on Motor Transportation

Oral arguments were heard by the Interstate Commerce Commission on March 1 and 2 on Examiner L. J. Flynn's proposed report proposing that the commission recommend to Congress a system of federal regulation of interstate commerce by motor vehicle and legislation providing for a co-ordination of rail and highway transportation. The railroads were represented by Alfred P. Thom, Jr., general solicitor of the American Railway Association, and Walter McFarland, general attorney of the Chicago, Burlington & Quincy, appearing for the Western Traffic Executive's Committee. They emphasized that the railroads are not advocating regulation of motor transportation for the purpose of destroying it but to the end that competition between the two forms of transportation shall be on a fair and equal basis. When Commissioner Eastman asked what legislation the carriers want to enable them to co-ordinate with motor transportation, Mr. McFarland said that the views of different carriers differ. Arguments were also presented by C. D. Cass, representing the American Electric Railway Association; Ivan Bowen, representing the Greyhound Lines and the National Association of Motor Bus Operators; J. E. Benton, general solicitor of the National Association of Railroad and Utilities Commissioners; T. R. Dahl and LaRue Brown, representing the National Automobile Chamber of Commerce; John S. Burchmore, for the National Industrial Traffic League; W. H. Chandler, of the New York Merchants' Association, and others. Mr. Burchmore and Mr. Chandler objected to federal regulation of trucks, saying it was proposed for the protection of the railroads, but that the railroads should be authorized to engage in motor transportation under such conditions that any losses could not be charged against railroad operations.

Anti-Injunction Bill Passed by Senate

The Senate, on March 1, passed by a vote of 75 to 5 the Norris "anti-injunction" bill, designed to curtail the authority of the courts to issue injunctions in connection with labor disputes. Among the advocates of the bill at committee hearings was Donald R. Richberg, counsel for the railway labor organizations, who based much of his argument on the circumstances of the injunction issued by Judge Wilkerson, of Chicago, at the request of Attorney General Daugherty, at the time of the shop-men's strike. Alfred P. Thom, general counsel of the Association of Railway Executives, testified in opposition to a similar bill before a House committee. Among the provisions of the bill are that no court shall have jurisdiction to issue injunctions in labor disputes to prohibit persons interested in such dispute from "ceasing or refusing to perform any work or to remain in any relation of employment"; becoming or re-

maining a member of a labor organization; "by all lawful means aiding any person participating or interested in any labor dispute who is being proceeded against in, or is prosecuting any action or suit in any court of the United States or any state"; "assembling peaceably to act or to organize to act in promotion of their interests in a labor dispute." It is also provided that no court shall have jurisdiction to issue an injunction upon the ground that any of the persons participating or interested in a labor dispute constitute or are engaged in an unlawful combination or conspiracy because of the doing in concert of the acts enumerated. Injunctions also are prohibited except on clear showing that unlawful acts have been committed and will be continued. It is also provided that no officer of a labor organization shall be held responsible or liable for the unlawful acts of individual officers, members or agents, except on clear proof of participation in or authorization or ratification of such acts.

Railroads Want Consolidation Law Changed To Omit I.C.C. Plan

At the appropriate time the railroads propose to ask Congress to modify the consolidation provisions of the transportation act to make them "more workable" and to omit the requirement that consolidations to be approved must be in harmony with a general plan promulgated by the Interstate Commerce Commission, Alfred P. Thom, general counsel of the Association of Railway Executives, testified on March 1 before the House committee on interstate and foreign commerce. Mr. Thom was objecting to provisions in the bill introduced to give the commission complete jurisdiction over all forms of acquisition of control, by holding company or otherwise, because it contains provisions that any such acquisition shall be in harmony with the commission plan. He said the bill was not correctly described as a "holding company" bill, but that it relates to the whole subject of the holding of railroad stock by anybody and that it would be more correct to describe it as a bill to regulate the holding of stock in common carriers. He said the reaffirmation in the bill of the plan provisions of the present law were not in the public interest and that it was not necessary to relate that matter to the holding company question, although he understood that it had been inserted to sustain the constitutionality of the provision authorizing the commission to require the divestment of stock holdings that might interfere with the carrying out of the plan. The railroads, according to Mr. Thom, had refrained from urging legislation because of a desire not to interfere with the commission's disposal of the application of the eastern carriers for a change in its 1929 plan to provide for four eastern systems, but he objected to having the proposal they would offer later prejudiced by reaffirmation of what they consider to be the great defect in the present law.

R. C. Fulbright, chairman of the legislative committee of the National Industrial Traffic League, expressed general approval of the plan and purpose of the

bill but wished to make it clear that the league is not approving the consolidation plan.

Senator King, of Utah, has introduced in the Senate a resolution, S. Res. 173, calling on the Attorney General to inform the Senate whether the instances of acquisition of control of railroads by various holding companies described by Commissioner Eastman in his testimony before the committee last week constitute conspiracies in restraint of trade in violation of the anti-trust laws; to inform it in what respect they differ from the transactions condemned by the Supreme Court in the Northern Securities case; and as to what steps, if any, the Department of Justice contemplates in the matter.

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

- AIR BRAKE ASSOCIATION.—T. L. Burton, Room 5605, Grand Central Terminal Building, New York City.
- ALLIED RAILWAY SUPPLY ASSOCIATION.—F. W. Venton, Crane Company, 836 S. Michigan Blvd., Chicago. To meet with Air Brake Association, Car Department Officers Association, International Railroad Master Blacksmiths' Association, International Railway Fuel Association, International Railway General Foremen's Association, Master Boiler Makers Association and the Traveling Engineers' Association.
- AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.
- AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C.R.R. of N. J., 143 Liberty St., New York.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Room 800, 1017 Olive St., St. Louis, Mo. Next meeting, June 14-16, 1932, Hotel Statler, Detroit, Mich.
- AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.—E. A. Abbott, Poole Bros., Inc., 85 West Harrison St., Chicago. Next meeting, Jan. 21, 1933.
- AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. R. R., 836 Federal St., Chicago. Next meeting October, 1932, Washington, D. C.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York.
- AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.
 Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.
 Freight Station Section.—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago.
 Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York.
 Protective Section.—J. C. Caviston, 30 Vesey St., New York.
 Safety Section.—J. C. Caviston, 30 Vesey St., New York.
 Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York. Next convention, May 24-26, 1933, Chicago.
- Division II.—Transportation.—G. W. Cover, 59 East Van Buren St., Chicago.
- Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.
- Division IV.—Engineering.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-16, 1932, Palmer House, Chicago. No exhibit by National Railway Appliances Association at 1932 meeting.
- Construction and Maintenance Section.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-16, 1932, Palmer House, Chicago.
- Electrical Section.—E. H. Fritch, 59 East Van Buren St., Chicago.
- Signal Section.—R. H. C. Balliet, 30 Vesey St., New York. Annual meeting May 10-11, 1932, Stevens Hotel, Chicago.
- Division V.—Mechanical.—V. R. Hawthorne, 59 East Van Buren St., Chicago. Next convention, June 23-24, Congress Hotel, Chicago.
- Equipment Painting Section.—V. R. Hawthorne, 59 East Van Buren St., Chicago.
- Division VI.—Purchases and Stores. W.

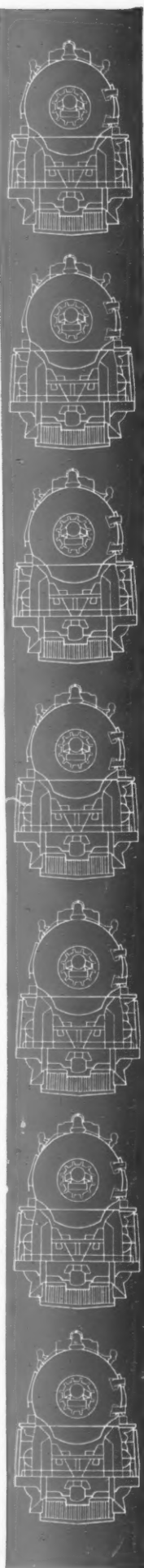
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J. Farrell, 30 Vesey St., New York, N. Y.

Division VII.—Freight Claims.—Lewis Pilcher, 59 East Van Buren St., Chicago.

Division VIII.—Motor Transport.—George M. Campbell, 30 Vesey St., New York.

Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 18-20, 1932, Royal York Hotel, Toronto, Ont. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. W. Large, Gen. Agri. Agt., C. R. I. & P. Ry., Chicago, Ill. Annual meeting, June 15-17, 1932, Brown Hotel, Louisville, Ky.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association, Division IV.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-16, 1932, Palmer House, Chicago. No exhibit by National Railway Appliances Association at 1932 meeting.

AMERICAN RAILWAY MAGAZINE EDITORS ASSOCIATION.—Miss E. Kramer, M-K-T Employees Magazine, St. Louis, Mo. Next convention, April 21-22, 1932, Plaza Hotel, San Antonio, Tex.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M., St. P. & P. R. R., 11402 Calumet Ave., Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.—E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Paul D. Mallay, Johns-Manville Corp., 292 Madison Ave., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1104 Chandler Building, Washington, D. C. Next convention, January 24-26, 1933, Chicago, Ill.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual convention, May 18-20, 1932, Louisville, Ky.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, Transportation Building, Washington, D. C.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—S. A. Baber, High Grade Manufacturing Co., 10418 St. Clair Ave., Cleveland, Ohio. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2276 Wilson Ave., N. D. G., Montreal, Que. Regular Meetings, 2nd Monday in each month, except June, July, and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 South Morgan Street, Chicago.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago. Regular meetings, 2nd Monday in month, except June, July, and August, Auditorium Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 So. Main St., Los Angeles, Cal. Regular meetings, 2nd Monday of each month, except July, August and September, Room 299, 610 So. Main St., Los Angeles. Club not active at present time.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—J. F. Brady, 4036 Scanlon Place, St. Louis, Mo. Meetings first Tuesday of each month, except July and August, American Hotel Annex, 6th and Market Sts., St. Louis, Mo.

CENTRAL RAILWAY CLUB OF BUFFALO.—T. J. O'Donnell, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 2920 Utopia Place, Hyde Park, Cincinnati, Ohio. Meetings 2nd Tuesday in February, May, September and November, Hotel Gibson, Cincinnati, O.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings second Monday each month, except June, July, August, Auditorium, Brotherhood of Railroad Trainmen's Building, West 9th St., and Superior Ave., Cleveland.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich.

INTERNATIONAL RAILWAY CONGRESS.—January 10-16, 1933, Cairo, Egypt.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. T. Winkless, Room 700, La Salle Street Station, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

MASTER BOILER MAKERS ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

MASTER CAR BUILDERS' AND SUPERVISORS' ASSOCIATION.—(See Car Department Officers' Association.)

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York. Annual convention, November 15-18, 1932, Hot Springs, Ark.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—Roy M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo. Next convention, May 17-18, 1932, Hotel Peabody, Memphis, Tenn.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 1014 South Michigan Ave., Chicago. Annual meeting, March 14, 1932, 1014 South Michigan Ave., Chicago. No exhibit at A. R. E. A. convention in 1932.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section; J. L. Walsh, (Honorary vice-chairman), Supt. Safety, M.-K.-T. R. R., Dallas, Tex. Next annual meeting, October, 1932, Washington, D. C.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, except June, July, August and September, Copley Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. W. Pye, 30 Church St., New York. Regular meetings 3rd Friday in month, except June, July and August, 29 W. 39th St., New York City.

PACIFIC RAILWAY CLUB.—W. S. Wollner, P. O. Box, 3275, San Francisco, Cal. Regular meetings 2nd Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1124 Woodward Building, Washington, D. C. Next convention, 1932, Buffalo, N. Y.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 1112 Shoreham Building, Washington, D. C.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa. Regular meetings, 4th Thursday in each month except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, Purchases and Stores Division and Motor Transport Division, American Railway Association. No exhibit at 1932 convention.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division I.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Next convention, September 20-22, 1932, Hotel Stevens, Chicago. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Drawer 24, M. P. O., St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August, Statler Hotel, St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A. Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, 4 Hunter St., S.E., Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. Ry., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville, Varnish Co., Louisville, Ky. Meets with A. R. A. Div. V. Equipment Painting Section.

TORONTO RAILWAY CLUB.—J. A. Murphy, P. O. Box 8, Terminal "A", Toronto. Regular meetings 1st Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., Carbon & Carbide Building, Chicago. Meets with Roadmasters and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, O.

WESTERN RAILWAY CLUB.—J. H. Nash, Dri-Stream Valve Sales Corp., 122 S. Michigan Ave., Chicago. Regular meetings 3rd Monday in each month, except June, July, August and September, Hotel Sherman, Chicago.

Equipment and Supplies

PASSENGER CARS

THE INTERBOROUGH RAPID TRANSIT COMPANY, New York, is asking for prices on 50 to 100 passenger cars for subway service.

THE CANADIAN PACIFIC has ordered from the International Equipment Company two gas-electric rail motor cars. These cars will be built by the Ottawa Car Company and will have power units supplied by the Electro-Motive Company. They are to be combination baggage and mail compartment cars for service between Winnipeg, Manitoba and Moose Jaw, Sask., using coach as trailer.

IRON & STEEL

THE NEW YORK CENTRAL contemplates entering the market shortly for its rail requirements for 1932 involving about 50,000 tons of rail.

THE BOARD OF TRANSPORTATION, New York City, has ordered 4,941 tons of 100-lb. track rail and 420 tons of guard rail, from the Bethlehem Steel Company.

SIGNALING

NORTHERN PACIFIC.—This company has applied to the Interstate Commerce Commission for relief from its orders requiring the continued maintenance and operation of an automatic train control device between Mandan, N. D., and Glendive, Mont., 215.6 miles. It is stated that the installation, made by the Sprague Safety Control & Signal Corporation, cost \$195,001 and that the cost of maintenance and operation for 1927, 1928, 1929 and 1930 amounted to \$56,200. Of this \$29,530 was for roadway and \$26,670 for locomotives and the average cost was \$14,050 a year. The company has 50 locomotives and 2 gas-electric cars equipped with the device. The petition says that the present and future conditions on this line do not and will not hereafter reasonably require the maintenance and operation of the device and that since March 1, 1916, not a single passenger has been killed in a train collision on the Northern Pacific.

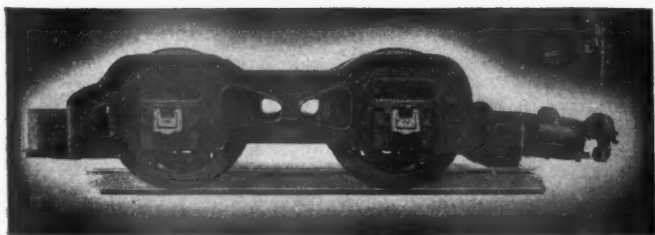
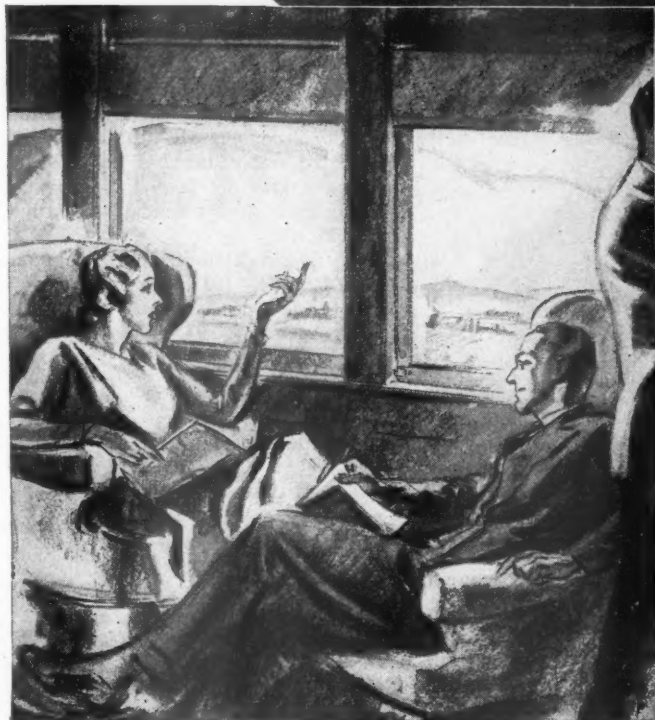
MISCELLANEOUS

THE READING has placed orders with the Westinghouse Electric & Manufacturing Company for 30 sets of multiple unit control, including necessary gears and pantographs, for the cars recently ordered as reported in the *Railway Age* of January 23. These orders involving about \$165,000 supplement one placed with Westinghouse when equipment was ordered last year for the first 68 cars, also a more recent order for trailer control equipment placed with the same company.

A Smooth Ride

ON THE C. & N. W. BETWEEN CHICAGO AND COUNCIL BLUFFS

TRAVELERS going east or west on the C. & N. W. between Chicago and Council Bluffs are treated to a ride free from annoying jerks and rough handling. The passengers appreciate why their trip is so smooth and so do the railroad's officials because Class "H" locomotives equipped with Locomotive Boosters are assigned to the following trains:



THE LOCOMOTIVE BOOSTER

TRAIN No.	NAME OF TRAIN	TERRITORY
15	Mountain Bluebird	Chicago-Council Bluffs
22	Corn King Limited	Council Bluffs-Chicago
13	The Columbine	Chicago-Council Bluffs
12	The Columbine	Council Bluffs-Chicago
27	San Francisco Limited	Chicago-Council Bluffs
8	Los Angeles Limited	Council Bluffs-Chicago
16	Mountain Bluebird	Council Bluffs-Chicago

With the extra power of the Booster available, engineers have no trouble starting heavy trains smoothly without taking slack. Acceleration to road speeds is faster. When grades slow down the speed, or bad weather makes track conditions poor for climbing, the Booster gives the extra power needed to climb the ruling grades at speed.

Booster power is extra power that can be turned on or off depending upon requirements. It is being incorporated in the passenger locomotives hauling the country's famous trains because of the improved comforts the Booster assures and the economies railroads are obtaining through its use. The Locomotive Booster has a big advertising value for passenger traffic departments.

FRANKLIN RAILWAY SUPPLY CO., Inc.

NEW YORK

CHICAGO

MONTREAL

Supply Trade

George E. Coffey, sales representative of the **Union Railway Equipment Company**, Chicago, has resigned.

J. S. Ullmann has been appointed Washington representative of **The DeVilbiss Company**, Toledo, Ohio, with headquarters at 4000 Cathedral avenue, Washington, D. C.

The Cleveland low-water alarm, which is now being supplied by the **Barco Manufacturing Company**, 1801 Winnetmac avenue, Chicago, has been renamed the Barco low-water alarm, under which designation it will be sold to the railroads in the future.

The Watson-Stillman Company, Roselle, N. J., has obtained the American rights to the Henley straight through lead sheathing presses and has entered into an agreement with **Davy Brothers**, Sheffield, Eng., covering the manufacture of Watson-Stillman equipment in England and the manufacture in the United States of certain of Davy Brothers' hydraulic equipment.

The Blaw-Knox Company, Pittsburgh, Pa., and the **Western Pipe & Steel Company**, San Francisco, Cal., and Los Angeles have closed an agreement whereby Western Pipe & Steel will manufacture Blaw-Knox products on the Pacific Coast. The sales will be made through a new company equally owned by the two above mentioned companies, to be known as the **Blaw-Knox & Western Pipe Corporation**.

H. B. Kehoe, manager of **Gillis & Co.**, Chicago, has been elected president, to succeed **Alexander D. Gillis**, who founded the company in 1892. Mr. Kehoe was born in Chicago on July 22, 1882, and in his early career was engaged in timber operations in Kentucky. In 1907, he became a partner of Gillis & Co. and since 1917 has been its active manager. Mr. Gillis was born in Green Bay, Wis., in 1859, and entered the employ of the Chicago & North Western where he advanced to the position of assistant division superintendent, from which position he resigned because of ill health. After an extended convalescence, he entered the employ of the Illinois Steel Company to handle their vessel and rail traffic. In 1892, he opened an office in the old Chicago lumber market under the firm name of Gillis & Co., specializing in cargo shipments of cedar ties. The company has continued in the business of producing and handling ties, broadening the scope of its operations to include all commercial woods.

William F. Drysdale has been appointed vice-president in charge of sales and **H. C. Butler** has been appointed vice-president in charge of manufacturing of the **Montreal Locomotive Works, Ltd.**, Montreal, Que., and all of its subsidiaries, according to an announcement of President William C. Dickerman. The company will manufacture and sell self-

propelled rail units in accordance with the engineering and specifications of the **J. G. Brill Company**, Philadelphia, Pa.; a complete line of process plants and equipment for the oil refining industry, using the patents and processes controlled by **Alco Products, Inc.**, New York; a complete line of modern Diesel engines in accordance with the designs and patents of the **McIntosh & Seymour Corporation**, Auburn, N. Y., and will continue to manufacture and sell steam, electric and Diesel locomotives as heretofore. Mr. Butler formerly was manager of the **Montreal Locomotive Works, Ltd.**, located at Montreal. Mr. Drysdale was born on July 16, 1881, at St. Andrews, Argenteuil, Que. He was educated in the Montreal high school and McGill University, receiving from the latter a B. S. degree in 1904. During part of this time, from 1899 to 1904, he was also a special apprentice with



William F. Drysdale

the Grand Trunk Railway. In 1904 he entered the employ of the American Locomotive Company as draftsman, subsequently serving as calculator and cost estimator until 1906, when he was appointed assistant to chief engineer in charge of machine tool, power and shop engineering problems. He resigned in 1911 to become mechanical engineer of the North Railroad of Costa Rica and the Ferrocarril de Costa Rica, Central America, remaining in that work, and also as superintendent of buildings for the United Fruit Company in Costa Rica, until 1914, when he was appointed assistant works manager of the Steel Company of Canada, in charge of shrapnel and high explosive shell work in the Montreal plants. He served in 1915 as special representative in Europe for the Montreal Locomotive Works, Ltd. and the American Locomotive Company. In 1919 he was appointed managing director, of the Worthington Pump & Machinery Company's interests in Belgium, France, Italy, Switzerland, Spain and Portugal. Five years later he was one of the organizers of the Brazilian Portland Cement Company, the first large Portland cement plant in the State of Sao Paola, Brazil. Mr. Drysdale is president of the Aerocrete Corporation of Canada, and a member

of a number of Canadian engineering societies.

Bucyrus-Erie Company

The annual report of the Bucyrus-Erie Company for 1931 shows a net income of \$823,977, as compared with \$2,439,461 in 1930. After dividends there was a deficit of \$545,329, compared with the surplus for the previous year of \$353,583. The profit and loss surplus was reduced to \$9,685,449, from \$10,230,778.

The income account, as compared with 1930, follows:

	1931	1930
Net sales	\$3,090,107	\$5,610,860
Operating expenses	1,864,649	2,425,575
Operating income	1,225,458	3,185,285
Other income	394,918	300,354
Total income	1,620,376	3,485,639
Depreciation	660,296	642,374
Taxes	136,103	403,804
Net income	823,977	2,439,461
Preferred dividends	478,100	478,100
Conv. pref. dividends	611,205	1,047,779
Common dividends	280,000	560,000
Deficit for year	545,329	*353,583
Previous surplus	10,230,778	9,877,195
P. & L. surplus	9,685,449	10,230,778

* Surplus.

Colorado Fuel & Iron Co.

The annual report of the Colorado Fuel & Iron Co. for 1931 shows a net loss of \$3,363,206, as compared with a net profit of \$298,649 in 1930. The surplus on December 31, 1930, amounting to \$5,491,186, was reduced to \$1,922,862, after deducting the net loss for the year of \$3,363,206 and dividends amounting to \$205,116.

The consolidated income account as of December 31, 1931, as compared with 1930, follows:

	1931	1930
Total earnings after deducting operating expenses (including ordinary repairs and maintenance and general taxes) and selling, administrative and general expenses	\$576,044*	\$3,402,848
Interest and other miscellaneous income	339,587	527,111
Interest on bonds and notes	\$236,457*	\$3,929,959
Provision for depreciation of plants and exhaustion of minerals	1,473,721	1,970,915
Federal income taxes of prior years	\$3,336,708*	\$334,969
	26,498	36,320
	\$3,363,206*	\$298,649

* Loss.

OBITUARY

Charles P. Wheeler, president of Pickands, Brown & Co., died of a heart attack at Pasadena, Cal., on February 27.

R. L. Allardyce, general superintendent of the International Creosoting & Construction Company, died at his home in Texarkana, Tex., on February 27.

George M. Judd, secretary and a director of the American Brake Shoe & Foundry Company, died at his home in New York on February 29, at the age of 71.

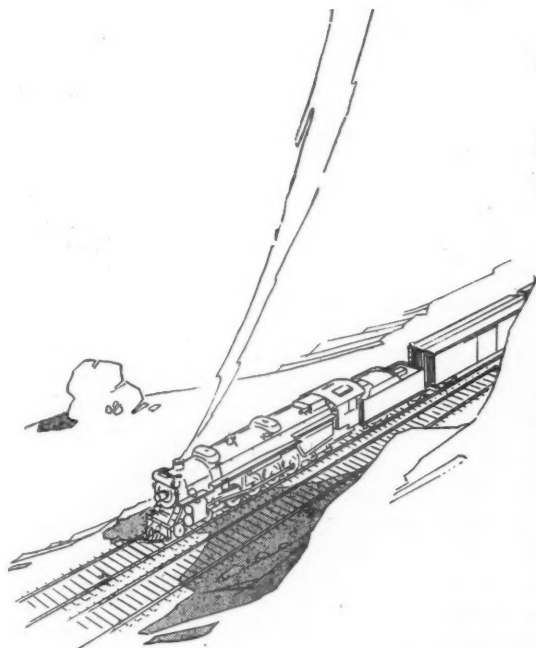
Burrows Sloan, chairman of the board of the General Refractories Company, Philadelphia, Pa., died in that city on February 28, at the age of 54 years. Mr. Sloan who was graduated from Prince-

THERE'S MORE TO SECURITY
ARCHES THAN JUST BRICK



Keep Down

The Special Brick Shapes



A CONSTANT fight for Arch Brick standardization is being waged by American Arch Company.

A special pattern of Arch Brick is an easy way out whenever locomotive Arches present a problem. But think what every special shape means in adding to the Storekeeper's worries.

American Arch Company has consistently kept patterns to a minimum. Shapes have been carefully standardized.

What is the practical result?

One railroad was using 146 distinct patterns and sizes of Arch Brick on its lines. Now, thanks to the standardized Arch Brick of the American Arch Company, all it needs are 25 patterns to care for all the locomotives on the road.

Consider the resulting economy in inventory, in space, breakage and in time of handling.

Most storekeepers are deeply appreciative of the constructive help constantly given them by American Arch Company.

**HARBISON-WALKER
REFRACTORIES CO.**
Refractory Specialists



AMERICAN ARCH CO.
INCORPORATED
Locomotive Combustion
Specialists

ton in 1899, was first employed by the Reading Company, later becoming associated with the Harbison-Walker Refractories Company, Pittsburgh. In 1911, with the late Governor Sproul of Pennsylvania, he organized the General Refractories Company at Philadelphia. He became president of the company in June, 1925, and since April, 1931, had been chairman of the board.

Benjamin B. Greer, who resigned in October, 1931, from the presidency of the New York Air Brake Company, died on February 28 at his home in New Canaan, Conn. Mr. Greer was born at Chicago on August 6, 1877, and was educated in the Chicago public schools, Armour Institute and Dartmouth College. In 1899 he entered railway service with the Great Northern and in 1908 went with the Chicago, Burlington & Quincy as transportation inspector, subsequently serving in various other capacities, including the positions of superintendent, assistant general manager and assistant to operating vice-president. In 1917 he was elected vice-president and general manager of the Colorado & Southern and the following year he was appointed assistant regional director, Central Western region, of the United States Railroad Administration. He was then from November, 1918, to 1920 federal manager of the Chicago, Milwaukee & St. Paul (now the Chicago, Milwaukee, St. Paul & Pacific). During the next five years he served as vice-president of operation on the same road and in 1925, he was elected president of the New York Air Brake Company.

TRADE PUBLICATION

REPUBLIC ELECTRIC WELD LINE PIPE CASING.—This is the title of a 36-page booklet recently published by the Republic Steel Corporation, Youngstown, Ohio, which contains a detailed description of the process of manufacturing this pipe, from the rolling of the flat plates to the application of the priming coat. In addition, tables are presented which give information on the weight, diameter, wall thickness, threads and couplings and mill test standards of various sizes of pipe. The booklet is printed in three colors and is attractively illustrated.

THE LONDON, MIDLAND & SCOTTISH of Great Britain has recently extended its rail-highway freight service to include the transportation of household goods. Under the new plan, as outlined in a recent issue of *Modern Transport* (London), the railroad is equipped to undertake the collection, loading and delivery of furniture, this door-to-door service being rendered with specially-designed demountable bodies to five-ton motor trucks which also move on railway flat cars.

Prior to its inauguration the new service was extensively advertised for several weeks with the vehicles traveling throughout the country to "demonstrate the manner in which the company proposes to cater to the needs of the householder."

Construction

CINCINNATI UNION TERMINAL.—Bids will be closed on March 16 for the construction of the substructure for the southwest elevated connection to the passenger terminal tracks, between Sixth street and the Southern Railway bridge.

NORTHERN PACIFIC.—The Interstate Commerce Commission has denied this company's application for permission to construct a 24-mile branch line from Woodrow, Mont., north to Bloomfield. Authority to build the line was originally granted on June 27, 1931, but the case was later reopened on a petition of the Great Northern, filed on July 22, and in the subsequent reargument the original finding was reversed, due weight being given to changed economic conditions in the territory to be served. Denial of the application, however, is without prejudice to further consideration of the case when conditions shall again justify construction of the line.

Financial

ABERDEEN & ROCKFISH.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of \$127,000 for the purpose of temporarily funding an issue of first mortgage bonds maturing May 1.

ALABAMA, TENNESSEE & NORTHERN.—*R. F. C. Loan.*—The Interstate Commerce Commission on February 26 approved a loan of \$275,000 from the Reconstruction Finance Corporation to meet various loans and bills payable. Approval of the loan by the R. F. C. was announced on March 2.

APALACHICOLA NORTHERN.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of \$200,000 to meet bank loans, unpaid wages and taxes, and to provide working funds of \$61,609.48 to "carry through the depression."

BOSTON & MAINE.—*Dividend Change.*—Directors of this company, meeting on March 1, took no action on the dividend due April 1 on prior preference stock and voted to recommend to stockholders that all preferred dividends be paid semi-annually hereafter. It was stated that the hope and expectation existed that a semi-annual dividend on the prior preference stock would be earned by and paid on July 1.

CAIRO, TRUMAN & SOUTHERN.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of \$75,000 to meet accounts payable.

CENTRAL OF GEORGIA.—*R. F. C. Loan.*—On an application for a loan of \$2,583,322 from the Reconstruction Finance Corporation, the Interstate Commerce Commission on February 25 approved an immediate loan of \$1,418,700 to enable it to meet interest payments due in February and to pay past due taxes and unpaid

vouchers. The Railroad Credit Corporation has approved a loan of \$206,687 and an order on the R. C. C. for this amount was to be pledged as part collateral for the loan, together with \$5,500,000 of bonds. The company has applied to the R. C. C. for a loan of \$2,593,251.

CHICAGO & EASTERN ILLINOIS.—*R. F. C. Loan.*—On an application to the Reconstruction Finance Corporation for a loan of \$7,196,436 the Interstate Commerce Commission on February 27 approved an immediate loan of \$3,629,500 to meet taxes, interest and maturing notes on March 1, to be secured by \$8,852,700 of prior mortgage bonds and an order on the Railroad Credit Corporation for \$76,500. Approval of the loan by the R. F. C. was announced on March 2.

CHICAGO & NORTH WESTERN.—*R. F. C. Loan.*—Upon an application to the Reconstruction Finance Corporation for a loan of \$26,000,000, the Interstate Commerce Commission on February 23 approved a loan of \$7,600,000, payable \$2,000,000 on February 25, \$850,000 on March 25, and \$4,750,000 on April 25 and repayable two years from these dates, to enable it to meet interest requirements and equipment trust obligations. The loan is to be secured by \$15,000,000 first and refunding mortgage bonds and by an order on the Railroad Credit Corporation for \$1,910,500. The company has applied to the R. C. C. for a loan of \$10,000,000.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of \$2,500,000 to meet current liabilities, including bank loans and interest.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue \$561,000 of first and general mortgage 6 per cent series B bonds to be pledged and repledged as collateral security for short term notes.

CHICAGO, NORTH SHORE & MILWAUKEE.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of \$2,300,000 to meet bank loans, notes, interest and an operating deficit.

CHICAGO, ROCK ISLAND & PACIFIC.—*Merger of Subsidiaries.*—The stockholders at the annual meeting of this company on May 5 will be asked to approve a plan whereby subsidiary railway lines outside of those in Texas would be merged with the Rock Island, thereby enlarging the basis for its first and refunding mortgage.

DENVER & RIO GRANDE WESTERN.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of \$4,000,000 to meet maturing loans and other current requirements.

DENVER & RIO GRANDE WESTERN.—*Asks More Time for Construction of Dotsero Cut-Off.*—This company has applied to the Interstate Commerce Commission for an extension of one year to April 15, 1933, of the time allowed by the commission for beginning construction work



QUALITY ALL WAYS QUALITY ALWAYS

THEY must be good from a chemical point of view—good from a physical point of view—good from a service point of view. Alco Forgings are just that kind. For years they have demonstrated their capability for reliable and enduring service.

Alco Forgings are precision built, not only precise in every dimension, but precise in every phase of manufacture. They are made from billets which must pass rigid tests for chemical properties and physical soundness. High carbon steels are subjected to a tensile test and alloy steels to a full macroscopic test. The billets are preheated under

pyrometer control before forging. Later the forgings are heat-treated, again under pyrometer control, to insure the best in grain refinement, ductility and tensile strength. Complete chemical, physical and microscopical equipment insures the closest control over Alco quality.

The extensive equipment necessary for this high quality represents an investment in plant facilities and years of research, far beyond the economical duplication in any railroad shop.

That is why we say it is much cheaper for a railroad to buy Alco Forgings than to equip, maintain and operate shops to manufacture them.

American Locomotive Company
30 Church Street New York N.Y.

on the Dotsero cut-off under the certificate issued by the commission. The company has also asked for an additional year in which to meet the commission's condition that it purchase minority stock of the Denver & Salt Lake at a price of \$155 a share. As a condition to the authorization for the acquisition of control of the D. & S. L. the commission required that the company purchase such stock as might be offered it in six months.

ERIE.—R. F. C. Loan.—On an application for a loan of \$10,350,000 from the Reconstruction Finance Corporation, the Interstate Commerce Commission on February 19 approved a loan of \$4,458,000 to meet equipment maturities, sinking fund payments, additions and betterments to the amount of \$923,000, and overdue vouchers, to be secured by pledge of \$8,916,000 of refunding and improvement mortgage bonds. Action on that part of the loan for the purpose of meeting bank loans was deferred pending an early understanding or agreement with the banks with respect to an extension of part of the obligations.

FONDA, JOHNSTOWN & GLOVERSVILLE.—R. F. C. Loan.—This company has applied to the Reconstruction Finance Corporation for a loan of \$315,000 to meet interest and other obligations.

FORT SMITH & WESTERN.—R. F. C. Loan.—The receivers have applied to the Reconstruction Finance Corporation for a loan of \$250,000 to meet overdue interest and taxes.

GEORGIA & FLORIDA.—R. F. C. Loan.—The receivers have applied to the Reconstruction Finance Corporation for a loan of \$1,000,000, of which \$316,500 is desired to pay accrued taxes and operating expenses and \$600,000 to refund receivers' certificates maturing June 1.

JASPER & EASTERN.—Control by C. & S.—The Interstate Commerce Commission has authorized the Colorado & Southern to acquire control of this railway by lease.

LEESVILLE, SLAGLE & EASTERN.—Abandonment.—The Interstate Commerce Commission has authorized this company to abandon as to interstate and foreign commerce its entire line of railroad between Leesville, La., and Slagle.

LEHIGH VALLEY.—Bonds.—The Interstate Commerce Commission has authorized this company to pledge and repledge \$2,500,000 of its general-consolidated mortgage 5 per cent bonds as collateral security for short term notes.

LOUISIANA, ARKANSAS & TEXAS.—Notes.—The Interstate Commerce Commission has authorized this company to issue a promissory note for \$180,000 for the purpose of paying interest on its first mortgage 6 per cent bonds and to issue and renew until June 30, 1934, not more than \$70,000 of notes to be used to pay taxes and operating expenses.

MERIDIAN & BIGBEE RIVER.—R. F. C. Loan.—This company has applied to the Reconstruction Finance Corporation for a

loan of \$1,250,000 to pay at maturity \$500,000 of first mortgage bonds and to complete construction work.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—R. F. C. Loan.—Upon an application for a loan of \$15,329,608 from the Reconstruction Finance Corporation, the Interstate Commerce Commission on February 25 approved loans aggregating \$2,300,000, to meet payments of taxes, principal and interest on equipment trust certificates and interest on notes, to be secured by an order on the Railroad Credit Corporation for \$486,000 and \$3,750,000 in securities. Action on an application of the Wisconsin Central for \$696,660 was deferred.

MISSOURI & NORTH ARKANSAS.—R. F. C. Loan.—The receivers have applied to the Reconstruction Finance Corporation for a loan of \$1,250,000 to meet taxes, wages, unpaid bills, interest and working capital.

MISSOURI PACIFIC.—R. F. C. Loan.—The Interstate Commerce Commission on February 19 approved a loan of \$2,800,000 on this company's application to the Reconstruction Finance Corporation for a loan of \$23,250,000 in addition to the \$1,500,000 approved on February 10. The loan is to meet interest payments and is to be secured by pledge of \$4,700,000 of first and refunding mortgage bonds. The company has also applied to the Railroad Credit Corporation for a loan of \$1,500,000.

MOBILE & OHIO.—R. F. C. Loan.—The Interstate Commerce Commission on February 25 approved a loan to this company from the Reconstruction Finance Corporation of \$785,000 as a temporary advance pending a loan authorized by the Railroad Credit Corporation of a like amount, to meet interest charges due February 1 and March 1. The company has applied for a loan of \$1,500,000.

NEW YORK CENTRAL.—R. F. C. Loan.—This company has applied to the Reconstruction Finance Corporation for a loan of \$7,000,000 for construction work in New York City.

NEW YORK, CHICAGO & ST. LOUIS.—R. F. C. Loan.—On an application to the Reconstruction Finance Corporation for a loan of \$33,000,000, the Interstate Commerce Commission on February 24 approved an immediate loan of \$9,300,000 to meet overdue vouchers, fixed charges and maturing bank loans prior to April 1, to be secured by certificates of deposit on 297,993 shares of Wheeling & Lake Erie stock and \$10,500,000 of N. Y. C. and St. Louis refunding mortgage bonds. The company has also applied to the Railroad Credit Corporation for a loan of \$4,900,000.

PITTSBURGH & WEST VIRGINIA.—R. F. C. Loan.—This company has applied to the Reconstruction Finance Corporation for a loan of \$7,541,000 to meet short-term notes, interest and taxes.

PITTSBURGH & WEST VIRGINIA.—Notes.—The Interstate Commerce Commission

has authorized this company to issue a promissory note for \$637,385 to evidence a loan for a like amount to be used in the payment of interest on funded debt.

ST. LOUIS-SAN FRANCISCO.—R. F. C. Loan.—Upon an application for a loan of \$17,998,542 from the Reconstruction Finance Corporation, the Interstate Commerce Commission on February 24 approved an immediate loan of \$2,805,175 to meet fixed interest obligations due by March 1, to be secured by \$4,014,000 of consolidated mortgage bonds and an order on the Railroad Credit Corporation for \$2,805,175.

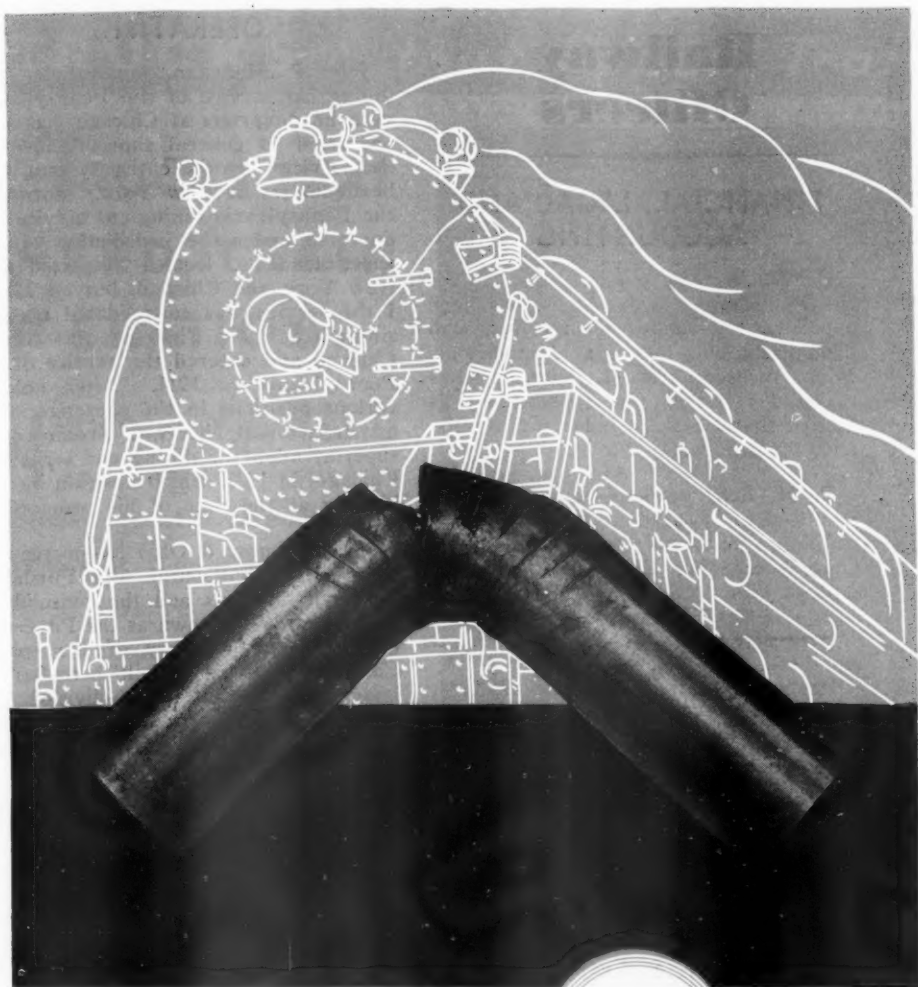
ST. LOUIS SOUTHWESTERN.—R. F. C. Loan.—This company has applied to the Reconstruction Finance Corporation for a loan of \$31,727,750, of which \$2,000,000 is desired to provide funds to meet possible deficiencies for which funds are not yet available from the Railroad Credit Corporation, to repay that corporation and to provide working capital; \$9,000,000 is desired by April 1 to retire bank loans, and \$20,727,750 to pay first consolidated mortgage bonds maturing June 1.

ST. LOUIS SOUTHWESTERN.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to nominally issue \$39,599,750 of general and refunding mortgage bonds, to be pledged as collateral for loans from the Reconstruction Finance Corporation amounting to \$31,727,750 for which application was made on January 25, or to be exchanged for bonds secured by any prior mortgage or notes secured by such bonds. Among other purposes it is proposed to refund \$20,727,750 of first consolidated mortgage bonds which mature June 1.

ST. LOUIS SOUTHWESTERN.—Deposit of Minority Stock.—The committee of stockholders of this company headed by J. F. B. Mitchell of Wood, Low & Co., has sent to minority stockholders a letter advising them that if they wish to accept the offer of merger with the Southern Pacific they should deposit their stock with the Guaranty Trust Company. Unless the Southern Pacific receives sufficient of the stock by April 29 to give it 85 per cent control it is free to withdraw the offer. In response to a request by the committee, Cotton Belt stockholders with holdings sufficient to provide the required percentage of control signified their willingness to deposit under the offer, but until now actual deposits of stock have not been asked.

SALT LAKE & UTAH RAILROAD.—R. F. C. Loan.—This company has applied to the Reconstruction Finance Corporation for a loan of \$500,000 to meet current obligations.

SOUTHERN.—R. F. C. Loan.—Upon an application for a loan of \$10,000,000 from the Reconstruction Finance Corporation, the Interstate Commerce Commission on February 26 approved an immediate loan of \$7,500,000 to meet interest requirements, unpaid vouchers for materials and supplies, etc., taxes and equipment trust



TOUGH PIN

It's a tough pin that will take a bend like this after being case hardened to a file hardness on the surface. « The case is good and deep, too, and the core of the pin is tough enough to stand the hard knocks of railroad service. « It's Agathon Nickel Iron, quenched right out of the case hardening pot and ready for service in brake rigging, spring rigging pins or motion work. « Nearly 1000 tons of Agathon Nickel Iron are already in service.

Toncan Iron Boiler Tubes, Pipe, Plates, Rivets, Staybolts, Tender Plates and Firebox Sheets
Sheets and Strip for special railroad purposes
Agathon Alloy Steels for Locomotive Parts
Agathon Engine Bolt Steel • Nitralloy
Agathon Iron for pins and bushings • Agathon

Staybolt Iron • Culverts • Climax Steel Staybolts
Upson Bolts and Nuts • Track Material,
Maney Guard Rail Assemblies • Enduro
Stainless Steel for dining car equipment, for
refrigeration cars and for firebox sheets
Agathon Nickel forging Steel (20-27 Carbon)



C E N T R A L A L L O Y D I V I S I O N

REPUBLIC STEEL CORPORATION

MASSILLON OHIO

obligations, to be secured by pledge of \$18,750,000 of development and general mortgage bonds. The company submitted an estimated income account for 1932 showing an estimated total deficit of \$5,953,712. Approval of the loan by the R. F. C. was announced on March 2.

SOUTHERN PACIFIC.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire control by purchase of stock of the San Diego & Arizona Eastern, a new company organized to acquire and operate the property of the San Diego & Arizona. The new company has also applied for authority to issue \$2,795,400 of stock for the purpose, which is to be sold for cash to the Southern Pacific.

UNION PACIFIC.—Lease of Subsidiaries.—At the annual meeting of the stockholders of this company to be held May 10 a proposal to have the company acquire closer control of its subsidiaries by leasing them will be put to a vote.

VIRGINIA SOUTHERN.—Abandonment.—The receiver of this company and R. E. Scott, et al., owners of the Marion & Rye Valley, have been authorized by the Interstate Commerce Commission to abandon as to interstate and foreign commerce the line formerly owned by the latter company extending from Marion, Va., to Sugar Grove, 18 miles, and the line of the latter company between Sugar Grove and Troutdale, 7.9 miles.

WESTERN PACIFIC.—R. F. C. Loan.—The Interstate Commerce Commission on February 29 approved loans to this company from the Reconstruction Finance Corporation, one for \$1,303,000 for one year to meet interest requirements, and one for \$799,000 for three years for various purposes including \$259,000 for construction on the northern California extension. The one-year loan is in anticipation of a loan approved by the Railroad Credit Corporation. The commission has authorized the company to issue \$15,000,000 of general and refunding mortgage bonds and a promissory note for \$5,000,000 to be pledged as collateral security for loans and for the notes, which are to be exchanged at par for 5 per cent debentures. Approval of the loan by the R. F. C. was announced on March 2.

Average Prices of Stocks and of Bonds

	Mar. 1	Last week	Last year
Average price of 20 representative railway stocks..	30.71	31.59	91.44
Average price of 20 representative railway bonds..	70.21	69.46	93.89

Dividends Declared

Boston & Maine.—Dividend on 7 Per Cent Prior Preference Omitted.
Pittsburgh, Ft. Wayne & Chicago.—Common, 1 1/4 per cent, quarterly, payable April 1 to holders of record March 10; Preferred, 1 1/4 per cent, quarterly, payable April 5 to holders of record March 10.
Reading Company.—2nd Preferred, 50c, quarterly, payable April 14 to holders of record March 24.

FIFTY-SIX NEW INDUSTRIES were established along the line of the Lackawanna in the year 1931, or 15 more than in 1930.

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

C. W. Wright, general solicitor for the Minneapolis & St. Louis, has been appointed counsel for the receiver, with headquarters as before at Minneapolis, Minn., succeeding **M. M. Joyce**, who has resigned to accept an appointment as United States district judge for the district of Minnesota.

T. H. Seay, general auditor of the Southern, has been appointed comptroller of that road and the Mobile & Ohio, succeeding **E. H. Kemper**, who died on January 30. **W. H. Luckett**, assistant general auditor, has been appointed Mr. Seay's successor as general auditor.

Mr. Seay was born on June 28, 1884, at Huntsville, Ala., and was educated in private, public and high schools, Chaffin Business College and Georgetown University. He entered the service of the Southern in March, 1901, as check clerk at Huntsville and served consecutively to June, 1906, as assistant cashier and ticket seller at Huntsville;



T. H. Seay

chief clerk and cashier at Sheffield, Ala.; chief clerk and station accountant at Huntsville, and chief clerk and cashier at Corinth, Miss. In 1906, he was appointed traveling auditor and auditor of station accounts, in which position he served until December, 1914, at which time he became chief clerk and auditor of station accounts. He served as auditor of station accounts from February 1, 1919, to February 29, 1920, and on the latter date he was appointed auditor of freight accounts. He served in this position until October, 1927, when he was promoted to auditor of the Cincinnati-New Orleans lines. He was appointed general auditor in August, 1928, the position he held until his recent promotion.

OPERATING

John F. Finnegan, superintendent of dining car service of the Pennsylvania, with headquarters at Chicago, has been promoted to general superintendent of the service over the entire system, with headquarters at New York. Formerly, the Pennsylvania dining car service was operated under the jurisdiction of two superintendents, located respectively in New York and Chicago, but on March 1 the service was consolidated under a single head. Mr. Finnegan was born in Chicago and entered the service of the Pennsylvania in 1911. After holding various positions in the passenger traffic department, he was promoted to superintendent of dining car service at Chicago, in 1927, which position he was holding at the time of his promotion.

The Baltimore & Ohio has merged its Connellsville, Pittsburgh and Pittsburgh Terminal divisions and the consolidated territory will be known as the Pittsburgh division. The territory of the former Connellsville division will hereafter be known as the Eastern sub-division, and those parts formerly called Pittsburgh division and Pittsburgh Terminal division will hereafter be known as the Western sub-division. Simultaneously with this consolidation the following appointments were made:

Name	Title	Headquarters
J. D. Beltz	superintendent	Connellsville, Pa.
W. F. Booth	assistant superintendent	Pittsburgh, Pa.
J. W. Schad	master mechanic	Glenwood, Pa.
C. E. McGann	assistant master mechanic	Connellsville, Pa.
EASTERN SUB-DIVISION		
J. L. Maher	division engineer	Connellsville, Pa.
T. M. Walker	signal supervisor	Connellsville, Pa.
W. E. Boyland	trainmaster	Connellsville, Pa.
E. C. McClelland	assistant trainmaster	Connellsville, Pa.
F. R. Browning	road foreman of engines	Connellsville, Pa.
WESTERN SUB-DIVISION		
G. B. Farlow	division engineer	Connellsville, Pa.
J. P. Buzzard	signal supervisor	Pittsburgh, Pa.
J. L. Norris	road foreman of engines	Glenwood, Pa.
W. J. Carroll	trainmaster	Pittsburgh, Pa.
A. N. Peters	assistant trainmaster	Washington, Pa.
C. L. Senheiser	terminal trainmaster	Glenwood, Pa.
B. Z. Holverstott	terminal trainmaster	Glenwood, Pa.
G. J. McDonough	assistant terminal trainmaster	Demmler, Pa.
A. B. Stealey	assistant terminal trainmaster	Allegheny, Pa.

TRAFFIC

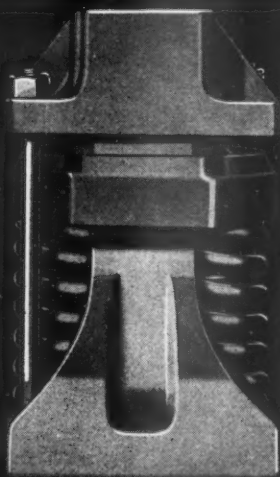
The Mobile & Ohio has moved its New York office to 500 Fifth avenue.

F. W. D. Goddard has been appointed general agent of the Virginian, with headquarters at Norfolk, Va.

TRUCKS *that Speed Train Operation*

...TRUCKS THAT SPEED TRAIN OPERATION...

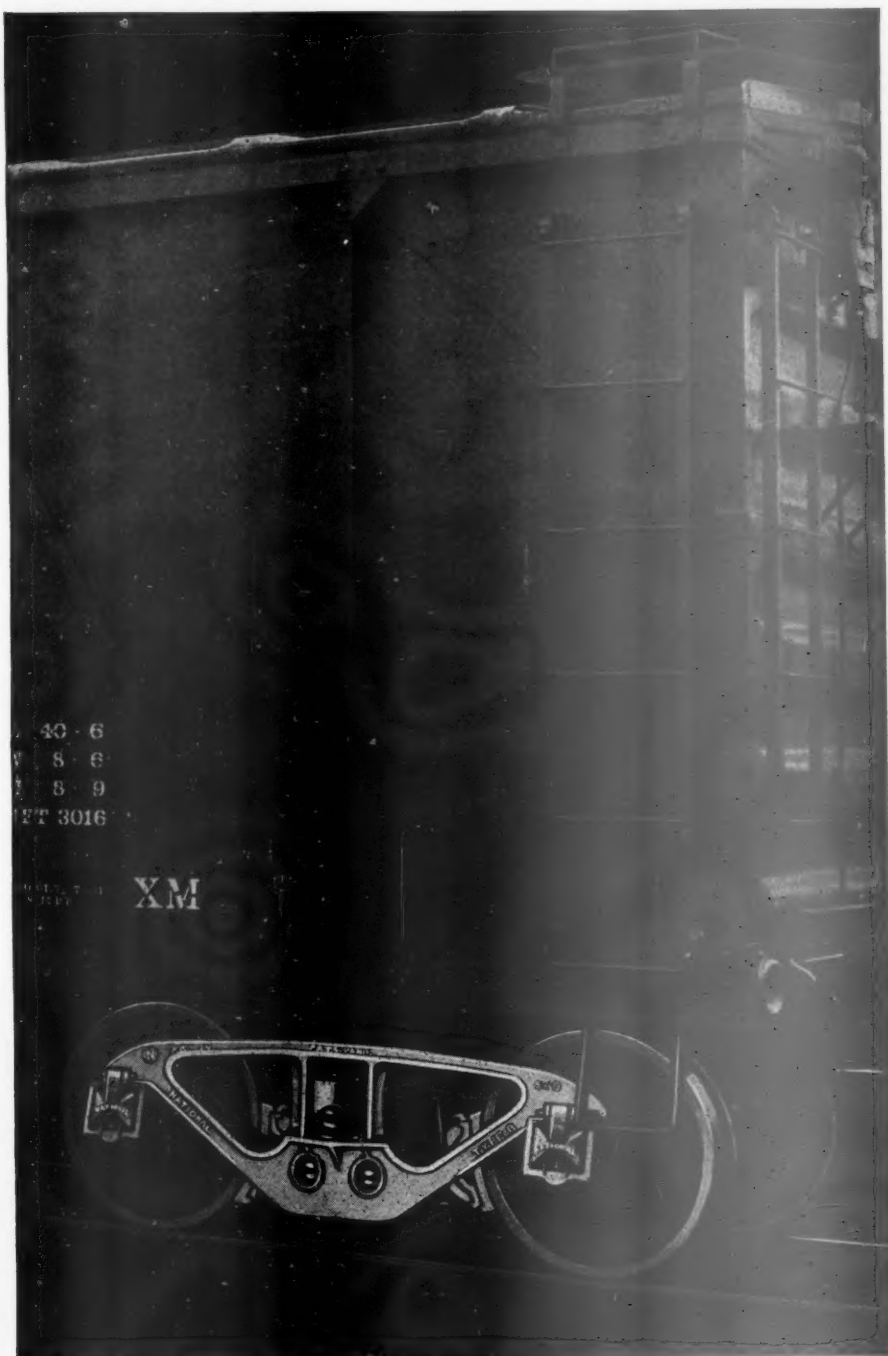
NATIONAL Type B trucks speed train operation by providing greater strength and less weight, thus permitting increased revenue loads. Their increased spring capacity (42% in excess of A.R.A. requirements) is a protection to roadbed, lading and equipment. Their design, which permits quick wheel change, speeds maintenance work. Cars equipped with National Type B trucks give more days per year of profitable service. Full details on request.



M17

National Draft Gear

Another contribution by National to profitable freight operation. This gear stands first in the combination of capacity, sturdiness and endurance.



NATIONAL MALLEABLE AND STEEL CASTINGS CO.

General Offices: CLEVELAND, OHIO

Sales Offices: New York, Philadelphia, Washington, Chicago, St. Louis, San Francisco

Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

NATIONAL

TYPE  B

TRUCKS

Lee H. Landis has been appointed general agent on the Pacific coast for the Louisiana & Arkansas and the Louisiana, Arkansas & Texas, with headquarters at Los Angeles, Cal.

B. F. Parsons, general freight agent of the Chicago Great Western, has been promoted to the newly-created position of traffic manager, with headquarters as before at Chicago. Mr. Parson's appointment became effective on March 1.

E. R. Gardner, assistant to the vice-president in charge of traffic of the Southern, with headquarters at Washington, D. C., has been appointed freight traffic manager (rates) of the Mobile & Ohio, with headquarters at St. Louis, Mo.

W. H. Dana has resigned as assistant general freight agent on the Union Pacific, with headquarters at Omaha, Neb., to become a member of the Standing Rate committee of the Transcontinental Freight Bureau, at Chicago, where he assumed his new duties on March 1.

E. T. Reynolds, assistant freight traffic manager of the Pere Marquette, with headquarters at Detroit, Mich., has been placed in direct charge of freight traffic solicitation for the system, reporting to the traffic manager in regard to such matters and to the freight traffic manager regarding other matters.

C. E. Stailey, general freight agent on the Illinois Central, has been appointed to the newly-created position of manager of perishable freight traffic, with headquarters as before at Chicago. **R. E. Barr**, sales manager of the Consolidation Coal Company, Inc., Chicago, has been appointed general coal agent of the Illinois Central, at the same point. This is also a newly-created position.

F. M. Jordan, newly-appointed general coal freight agent of the Baltimore & Ohio, was born in South Olive, Ohio, on December 27, 1884. He received his early education at the public schools of South Olive and later took a correspondence course in traffic at the La Salle Extension University. He first entered the service of the B. & O. in 1906, as rate clerk in the freight office at Marietta, Ohio, six months later being made chief clerk at the same point. In 1909, he became chief claim clerk in the general freight office at Cincinnati, Ohio, and the following year he was transferred to Shawnee, Ohio, as agent and yardmaster. Mr. Jordan was promoted to freight agent at Marietta in 1916, and later that year he became traveling freight agent with headquarters at Columbus, Ohio. He then received successive promotions as commercial freight agent at Wheeling, W. Va.; division freight agent at Grafton, W. Va., and division freight agent at Charleston, W. Va. In 1923 he was appointed coal freight agent at Pittsburgh, Pa., the position he held until his recent appointment as general coal freight agent.

Raymond W. Anderson, recently appointed coal freight agent of the Baltimore & Ohio at Pittsburgh, Pa., was born in Big Run, Pa., on August 20, 1895. He attended public schools in Big Run and the Clarion State Normal School, Clarion, Pa. After teaching school for three years at Curwensville, Pa., Mr. Anderson entered the service of the Buffalo, Rochester & Pittsburgh in 1916 as a clerk in the transportation department at DuBois, Pa. He was furloughed for service in the World War in 1918, and re-entered the employ of the railroad in 1919, as cashier in the same department. In 1920, he was appointed traveling freight agent at DuBois and New Castle, Pa., and three years later he was appointed chief clerk in the freight traffic department at Rochester, N. Y. He became assistant general freight agent at Rochester in 1928, and in 1930 he was advanced to coal traffic manager, the position he held until his recent promotion.

J. P. DeVaughn, who was recently appointed general passenger agent of the new Buffalo-Rochester district of the Baltimore & Ohio, at Rochester, N. Y., was born on April 14, 1881, in Wood County, W. Va. He entered the service of the Baltimore & Ohio in June, 1898, serving in various capacities in the freight station at Washington, Pa. He was appointed ticket agent at the same station in March, 1904, and in May,



J. P. DeVaughn

1905, he was transferred to Pittsburgh, Pa., as assistant city ticket agent. In June, 1906, he became connected with the Buffalo, Rochester & Pittsburgh as city passenger and ticket agent at Pittsburgh. He was transferred to Buffalo as division passenger agent in January, 1911. In May, 1929, he was advanced to general passenger agent, with headquarters at Rochester, N. Y., in which capacity he will continue to serve with the Baltimore & Ohio, which recently absorbed the B. R. & P.

SPECIAL

E. B. Hawken has been appointed staff recorder of the Canadian National, succeeding **W. L. Pinkney**, who died suddenly on February 17.

OBITUARY

Andrew Christeson, formerly vice-president, western departments, of the American Railway Express Company (now the Railway Express Agency, Inc.), died at his home at Los Altos, Cal., on February 25. He was 75 years of age.

George B. Fravel, who retired as superintendent of motive power of the Western region of the Pennsylvania, with headquarters at Indianapolis, Ind., in 1931, died in that city on February 27. He was born in Columbus, Ohio, and graduated from Ohio State University in 1888, entering the employ of the Pennsylvania in the same year in the shops at Columbus. In 1892, he was appointed assistant master mechanic of the Indianapolis shops and, in 1896, became general foreman and road foreman of engines. In 1903, he became master mechanic at Chicago and was promoted to superintendent of motive power at Columbus in 1920. Later he was promoted to assistant general superintendent of motive power, with headquarters at Chicago and, in May, 1928, was appointed superintendent of motive power at Indianapolis.

Henning Fernstrom, who retired as chief engineer of the Virginian in 1927, died on February 26 at Norfolk, Va. From 1881 to 1885, he was employed in the engineering departments of various railways and served as an assistant engineer on the construction of a railroad bridge across the Mississippi river at St. Paul, Minn. From the latter date to 1900, he was chief engineer of the Chicago Great Western and its predecessors and, during the following year, served as chief engineer of the St. Joseph & Grand Island (now part of the Union Pacific System). In 1901, he became principal assistant engineer and later assistant chief engineer of the New York Central & Hudson River, which position he held until 1903, when he was promoted to chief engineer. In 1905, he resigned to become chief engineer of the Virginian, from which position he retired in 1927.

R. B. Robertson, assistant traffic manager of the Los Angeles & Salt Lake (unit of the Union Pacific System), with headquarters at Los Angeles, Cal., died on February 27, at that place while playing golf. Mr. Robertson was born on April 18, 1879, near Milwaukee, Wis., and entered railway service at the age of 10 years as an office boy with a railroad in Wisconsin, later becoming a clerk in the traffic department. Subsequently he went with the Chicago, Indianapolis & Louisville as general freight agent at Chicago where he served until the World War, when he was appointed assistant chief of the inland traffic service, United States War department. At the termination of federal control of the railroads on March 1, 1920, Mr. Robertson entered the service of the Union Pacific as assistant freight traffic manager at Chicago, being sent to Los Angeles on October 1, 1925, as assistant traffic manager.